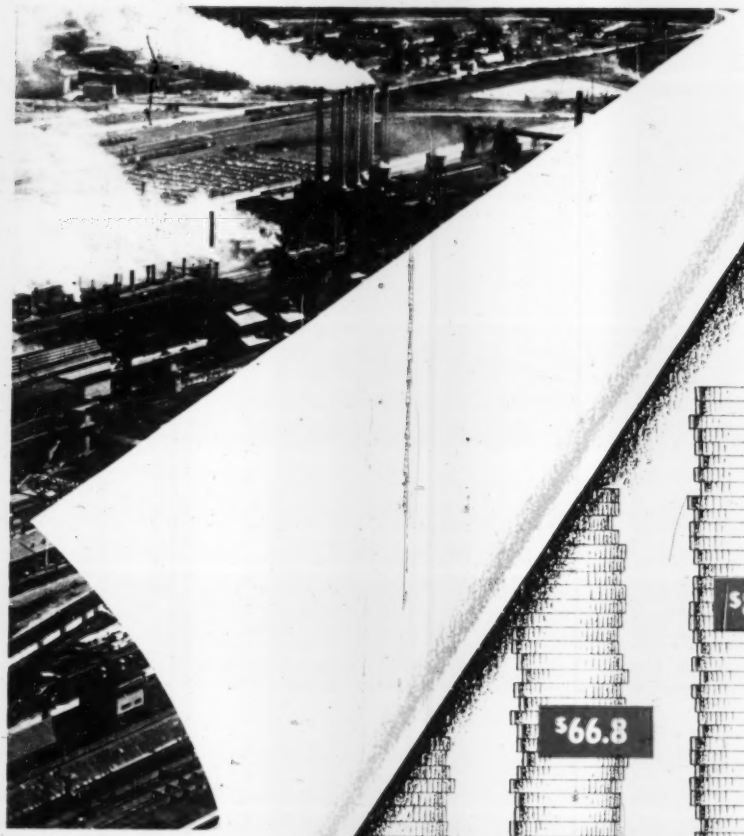
JULY 2, 1951

MIDYEAR REVIEW AND FORECAST ISSUE

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



OF METALWORKING SALES

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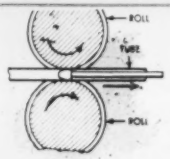
—see page 45

*Estimated by STEEL

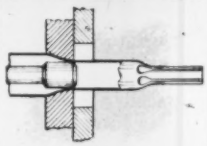
let's take a CLOSER LOOK at Surface Finishes

If you machine or fabricate hollow parts from tubing, chances are you have one or more *finishing* problems. Perhaps you can *start* finishing right in your own purchasing department by specifying the type of mill-finish best . . . and most economically . . . suited to your end-use requirements.

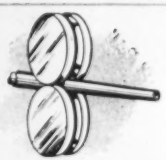
As a specialty tube mill, B&W can supply mechanical tubing with any of the following finishes — as an integral part of the manufacturing process:



HOT-FINISHED
bears the scale formed during hot fabrication or heat treatment.

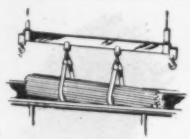


COLD-DRAWN
smooth, scale-free surface.



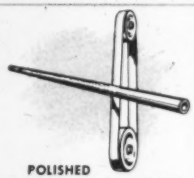
ROCKED
smooth surfaces, obtained by special sizing and finishing process.

TURNED
machined, uniform O.D.



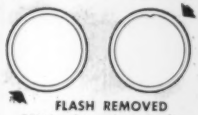
PICKLED
de-scaled by one of several solutions.

SHOT- OR SAND-BLASTED
O.D. and/or I.D. scale is removed by blasting.



POLISHED
O.D. and/or I.D. polished to one of several specified degrees of smoothness.

FLASH-IN
ERW tubing which retains the bead formed by welding.



FLASH REMOVED
ERW tubing, bead - free.
Both available either as welded or normalized.

Remember—tubing is not just bar-stock with a hole in it, but a semi-finished product, having a wide range of optional finishes, tolerances, chemical and mechanical properties. Ask Mr. Tubes — your B&W Tube Company representative — to help you select the tubing best suited to your particular applications.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY

***Executive Offices:* Beaver Falls, Pa.**

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Alliance, Ohio—Welded Carbon Steel Tubing

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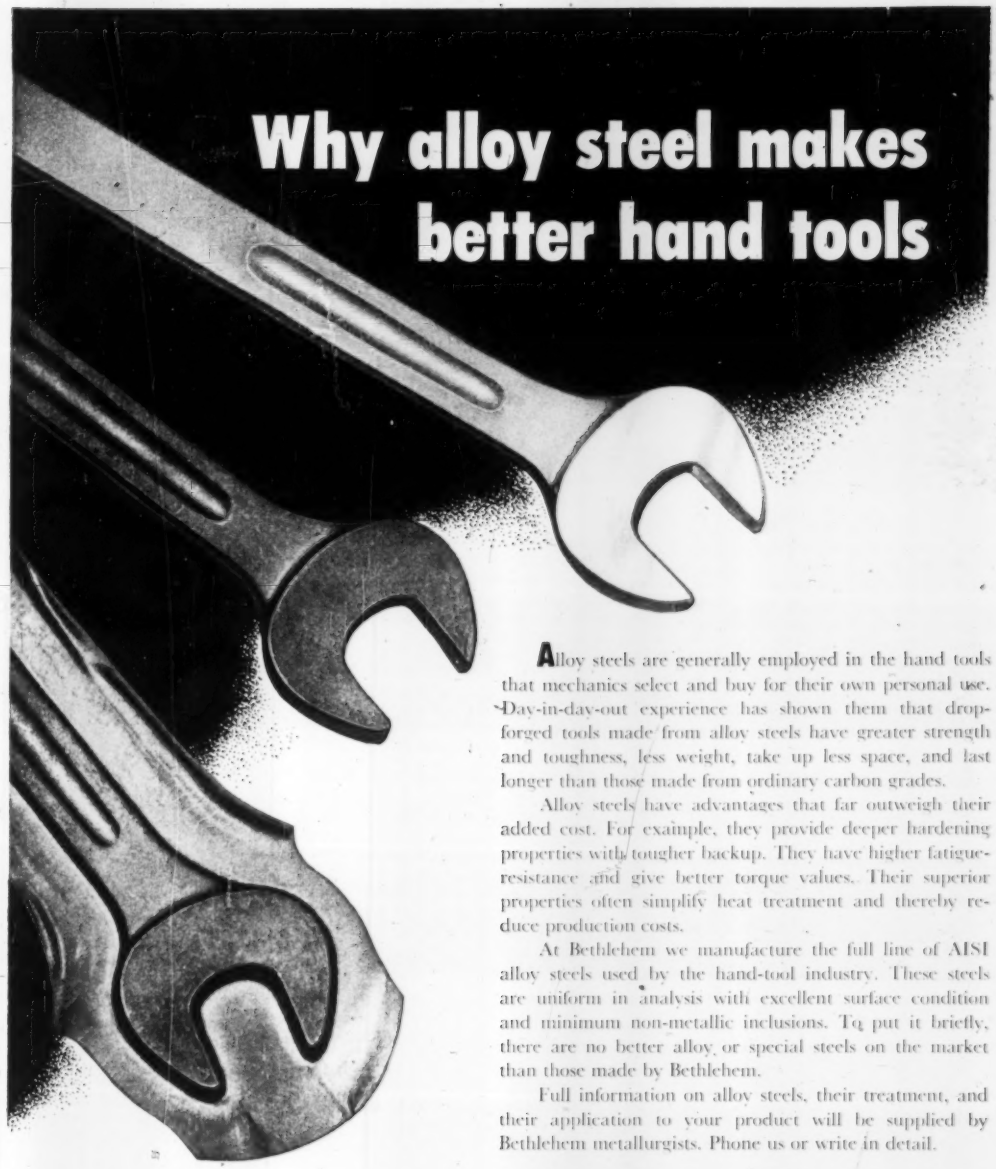
TA-1639M



Why alloy steel makes better hand tools

Alloy steels are generally employed in the hand tools that mechanics select and buy for their own personal use. Day-in-day-out experience has shown them that drop-forged tools made from alloy steels have greater strength and toughness, less weight, take up less space, and last longer than those made from ordinary carbon grades.

Alloy steels have advantages that far outweigh their added cost. For example, they provide deeper hardening properties with tougher backup. They have higher fatigue-resistance and give better torque values. Their superior properties often simplify heat treatment and thereby reduce production costs.

At Bethlehem we manufacture the full line of AISI alloy steels used by the hand-tool industry. These steels are uniform in analysis with excellent surface condition and minimum non-metallic inclusions. To put it briefly, there are no better alloy or special steels on the market than those made by Bethlehem.

Full information on alloy steels, their treatment, and their application to your product will be supplied by Bethlehem metallurgists. Phone us or write in detail.

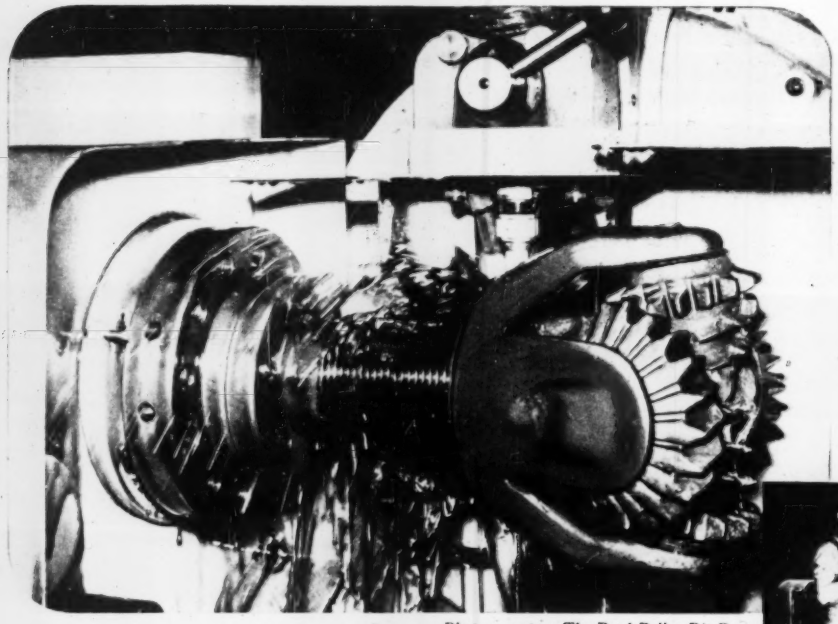
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

FACTS on improving production!



Photos courtesy The Reed Roller Bit Co.

4 inch diameter, 4 pitch API Threads ground from the solid in one pass of the wheel

The Reed Roller Bit Company's first concern is to maintain the highest possible quality in their products. They place special emphasis upon the development of improved manufacturing methods. A notable instance is their increased use of Jones & Lamson Automatic Thread Grinders.

These machines, in the skilled hands of Reed men trained in their operation, are helping to turn out better products for the drilling industry.

In addition to better quality threads and more uniform finish J&L Automatic Thread Grinders:

reduce handling costs
eliminate costly rethreading after heat treatment
eliminate expensive retooling when specifications change
reduce the cost of gage maintenance

Now, more than ever, the most efficient machines and methods are needed to make the most of your available manpower and material. Jones & Lamson engineers are available to help you with your turning, threading and inspection problems. Write *today* to Department 710.

Turret Lathes—Fay Automatic Lathes—Thread Grinders—Optical Comparators—Threading Dies

JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

Machine Tool Craftsmen Since 1835

What makes the plate ship-shape?

...*a brush!* Ask this shipyard worker. He knows that for top quality joints, steel plates should be free of rust and dirt before welding and he knows the way to clean them *fast* is with Osborn power brushes.

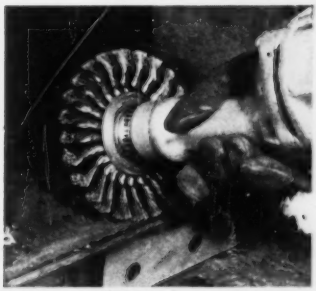
The world's leaders in this field are Osborn Disc-Center* Wire Wheel Brushes and Wire Cup Brushes. These rugged tools clean parts prior to welding. And they clean slag and weld spatter from joints after welding. Their high-speed, efficient operation gets the jobs done quickly . . . saves precious man-hours!

Fabrication cleaning is only one of many places where you can save time and improve products with power brushing. The **O**sborn **B**rushing **A**nalyst will gladly survey your *cleaning* and *finishing* operations to help you. Call or write *The Osborn Manufacturing Company, Dept. 513, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

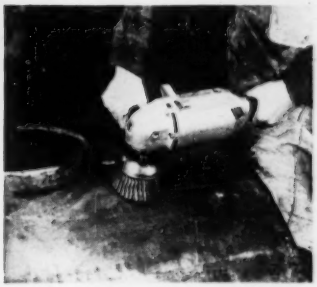
*Trademark

OSBORN

LOOK FOR THE NAME OSBORN...RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



GETS INTO CORNERS. This type of Osborn Disc-Center Wire Wheel Brush is popular for general fabrication. It digs into simple corners of fillets . . . and into the grooves and pits of welds.

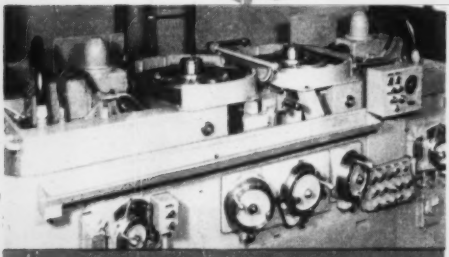


FAST ON THE FLAT. The cup type brush is ideal for joint preparation and for cleaning off weld scale and spatter from flat surfaces. It also gets into the corners.

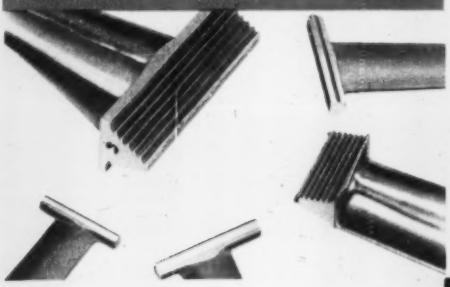
CLEAN-UP JOBS are handled fast with the Osborn Monitor® Wire Wheel Brush. Its narrow face makes it an efficient tool for getting into confined areas to remove rust, grit, old paint.

Production-Proved

EX-CELL-O Machine Grinds Jet Blade Roots



The machine uses two wheels to grind both sides of this root form simultaneously.



Dovetail and pinetree forms, in various sizes, are ground from rough forgings.

PRECISION TWO-WHEEL FORM GRINDER GIVES FINE FINISH, HIGH PRODUCTION

This production-proved Ex-Cell-O Precision Two-Wheel Form Grinder finishes roots of jet engine blades with speed, economy and precision. It is fully automatic except for loading, unloading and pushbutton starting.

Two 24-inch diamond-dressed grinding wheels are used, the work reciprocating between them. Dovetail or pinetree forms of various sizes can be ground economically from the rough forgings. Work reciprocation, wheel feed to finish size, coolant control, unclamping, wheel retraction, and wheel dressing are all done in an automatic cycle.

Controls are so simple that unskilled operators can do this high precision work. For more information and complete specifications contact Ex-Cell-O in Detroit.

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MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

XLO

51-34

STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 1 JULY 2, 1951

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Next Week . . . Extruded and Drawn Steel Cartridge Cases Advance Toward Standardization . . . Product Development Program Hits Stride at Osborn . . . Segregates in Steel Analyzed Spectrographically

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PELRON TECHNICAL SERVICES include, free, expert advise on facilitating many metal-working operations, through the use of PELRON special chemicals for industry: cutting oils, grinding, drawing and forging compounds, metal cleaners, rust preventives, etc., etc., etc.

Write us regarding your special problems. We're always "looking for trouble"—with the object of licking it, reducing *your* worries, increasing *our* experience.

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Behind the Scenes...

Speedster

Cleveland Cliffs Iron Co.'s *Cliffs Victory*, the ore freighter brought from the Atlantic ocean to the Great Lakes via the Mississippi and Chicago river systems, should get a ticket for speeding, Marine City, Mich., residents charge.

River bank residents say the 620-foot vessel zipped too fast through the narrow St. Clair river channel, throwing up waves that washed away lawns and docks and tossed fish up on their front porches.

The *Victory* was anything but a speed demon when it squeezed through the Chicago river in May while thousands watched. It inched along at about a mile an hour as it bumped and scraped its way through the river.

Power of the Press

You will recall that a while back (June 18) we carried an item on the difficulties John's Chili Parlor was having in getting steel. Gentle readers, we have influence. At least one steel supplier has offered to help. Tubular Service Corp., Springdale, Pa., has written in to say they will see what they can do for the people at the chili parlor.

Bottle in the Sky

We arrived at our office the other morning, in what we considered our normal state. We glanced out the window, and there before our eyes was a giant beer bottle floating in the sky. We looked again in a few minutes, but it was still there. We got a grip on ourselves, dug up some binoculars we usually use to look at ore vessels coming into the Cleveland harbor.

The bottle was a balloon anchored down on the lakefront. It was an advertising stunt to publicize a local brew. The more we looked at that bottle the more repulsive the whole thing appeared. We hereby resolve never to touch a drop of the stuff being promoted.

A Look Ahead

We supply the crystal balls, beginning on p. 45. There begins STEEL's annual midyear review and forecast, designed to bring you up to date on how the major economic trends in the past six months have acted and how they are expected to operate in the next.

STEEL's editors got the consensus among metalworking executives, economists and bankers to work up the article.

Another special job, the guide to CMP, appeared last week, June 25. For reprints, contact Readers' Service Department, Penton Bldg., Cleveland 13. They cost 50 cents each.

STEEL Is a Winner

In *Industrial Marketing's* 13th annual Editorial Achievement Competition, we won a certificate of merit for an outstanding series of articles the one on depreciation reform.

Tail of the Dog

We're wondering if the tail will wag the dog. The other day, an order came in, with check, for a year's subscription to "The Weekly Magazine of Metalworking." That refers to STEEL, of course, and is our subtitle.

Puzzle Corner

The June 18 problem was answered correctly by these people who were the first in with replies: Ralph Pappenheimer of Specialty Devices Co., Robert W. Huff of Canton, O., E. Buschow of Surface Combustion Corp. and R. E. Arnold of Fort Pitt Bridge Works. If you're of normal height, you would have had no difficulty in walking under the telephone wire around the earth's circumference because the poles would be 7,96 feet high.

Of three men, Al could purchase a watch if he used all his money plus half of the combined resources of Bill and Charlie. Bill could purchase the watch using all his money plus one-third of Al's and Charlie's. Charlie could buy the watch using all his money plus one-fourth of Al's and Bill's. What is the cost of the watch? How much money have Al, Bill and Charlie respectively?

Shrdlu

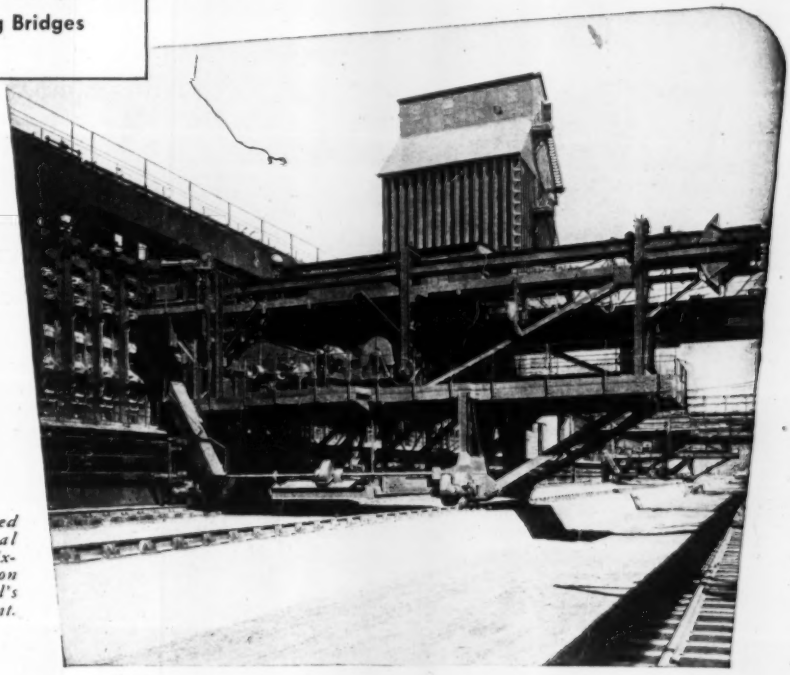
(Metalworking Outlook—Page 37)

Wellman will build it

- Coke Guides
- Coke Pushers
- Coke Quenching Cars
- Door Extractors
- Door Machines
- Coal Charging Larries
- Revolving Car Dumpers
- Coal Handling Bridges

Wellman Coke Pushers

for the Modern Coke Plant



Wellman Combined Coke Pusher, Coal Leveler and Door Extractor in operation at Bethlehem Steel's Lackawanna Plant.

● Many of the world's most modern byproduct coke oven plants are Wellman equipped. The Wellman Engineering Company's more than half-century experience in building heavy machinery guarantees sound design and expert construction. Wellman equipment provides peak economy, maximum safety and trouble-free performance under a wide variety of operating conditions. For conservative, reliable recommendations on your heavy equipment, phone or write:

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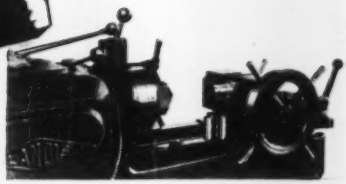
A COMPLETE Thread Engineering SERVICE

- Product Design
- Process Development
- All Types of Threading Equipment
- Special Applications



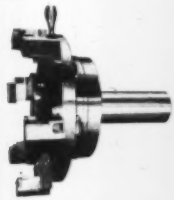
A 1½" Single LANDMACO Machine equipped with special work holding fixture for threading adapter sleeves.

New and improved products often create unprecedented threading problems—both in design and production. Realizing this, we offer all manufacturers the help of our Thread Engineering Service in efficiently and economically solving their Thread Problems.

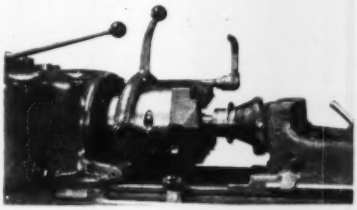
The difficulty may be in designing a thread which will function properly as an operating part, or in producing a thread already designed. Whatever the problem our Engineering Department is ready to help with advice and assistance—or to undertake the solution alone.

After examining all phases of the problem, the necessary recommendations will be made on basic Thread Design, the production process, and the Threading Equipment that should be used. For example, often a difficult Thread Production problem can be solved with a slight change in basic Thread Design. Occasionally, a job is so unique that special equipment is needed —three such Special Equipment Applications developed by our Engineering Department are illustrated.

Whatever your Thread Problem, use our THREAD ENGINEERING SERVICE. Hundreds of manufacturers have been able to perform difficult threading operations efficiently and economically with Landis Threading Equipment. The years of Thread Experience and Engineering Know-How that has brought LANDIS to the fore in Thread Generating is at your service. May we help you?



A Special Die Head (LANDMATIC 40AXX) designed and built to thread valve seat rings up to diameters of 14¾".



A 1½" Single LANDMACO Machine equipped with special carriage front for threading axle housings.

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

Protection Advantages that SAVE MORE ACTUAL CASH Than Your Fence Will Cost!

MADE OF *KONIK STEEL

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- Increased Outdoor Storage Space
- Reduced Accident Incidence and Liability
- Increased Order and System
- Better Appearance, Higher Property Value
- Increased Production, Better Inventory Control
- Lasting Protection Against Theft, Vandalism
- Reduced Fire Risk, Lower Insurance Rates
- Greater Security, Peace of Mind

STEEL MILLS NEED SCRAP BECAUSE YOU NEED STEEL

No other fence provides such long-lasting day-and-night protection at such low cost per year of fence life. Continental Chain Link pays for itself with years of "care-free" service because it is made of KONIK—an open hearth alloy steel containing copper, nickel and chromium. KONIK gives you extra strength—extra resistance to rust and corrosion. Write Continental for free fence manual—or contact our nearest sales office.

*Due to present National Defense requirements for nickel and chromium, two critical war materials, Continental fence will not be available in "Konik" Steel for the duration of this emergency.

*Trade Marks Reg. U. S. Pat. Off.

Your Fence Installation Tailored to Fit Your Property

Experienced fence engineers work with you, planning and laying out the most effective and economical fence installation.

Tailored to fit and harmonize with your property. Continental fence is erected under the supervision of experienced engineers.

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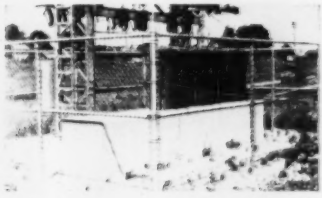


Continental fence has 14 distinctive construction features in addition to full-gage galvanized wire of KONIK steel.

CONTINENTAL STEEL

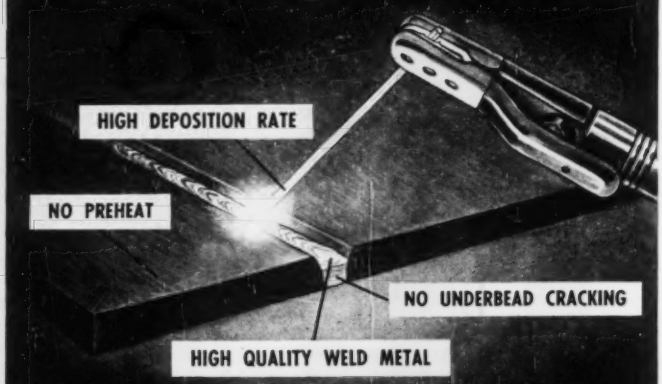
CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

ARCOS

Low Hydrogen Electrodes



Speed Production—
Save Critical Materials

Producing quality welds on high tensile fabrication jobs is essential today. Rewelds cost time and money. That's why it will pay you to depend on ARCOS—leader in the low hydrogen electrode field.

You get trouble-free, uniform welding performance because low hydrogen electrodes get the same rigid quality controls developed for the very critical requirements of Stainless. Arcos low hydrogen electrodes stay "factory fresh" because they are packaged and protected against moisture pick-up in the same careful way Arcos has always packaged its stainless electrodes.

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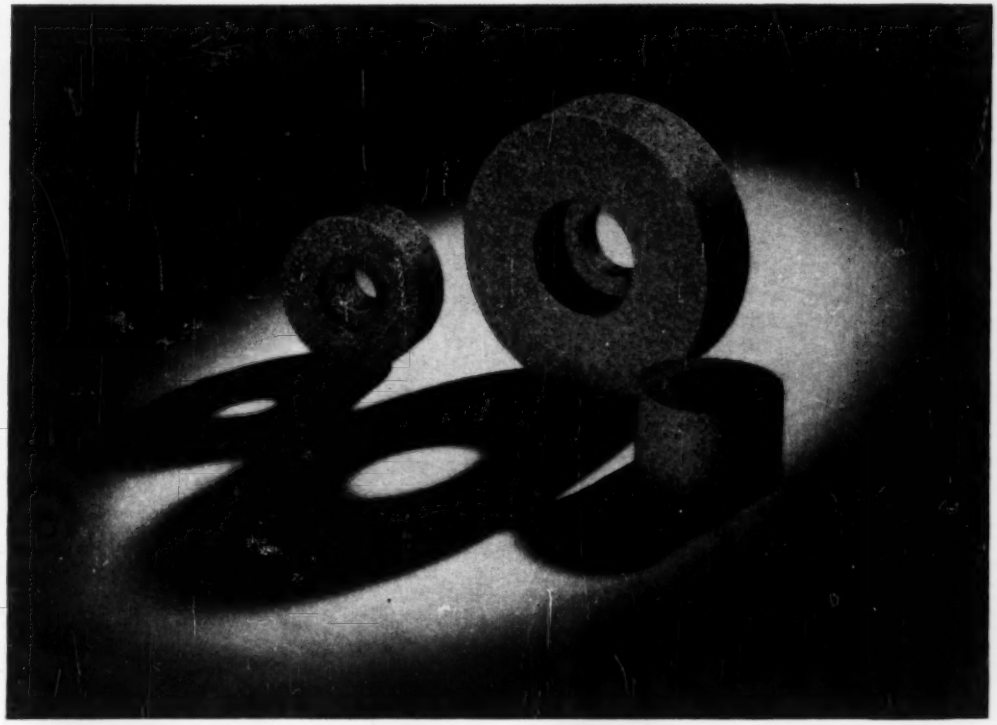
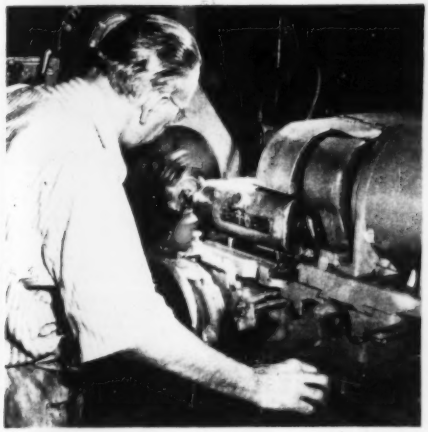




Cuts fast, free, cool...

High production rates and a free, cool cut are outstanding features of V1 Bond Internal Grinding Wheels by CARBORUNDUM. You'll see money saved through excellent form holding qualities which lengthen wheel life through reduced and uniform compensation for wheel wear, requiring fewer machine adjustments during a run. V1 Bond Wheels are being applied effectively to a wide range of internal production grinding. Minimum number of grades required simplifies stocking problems. Many other advantages. See your CARBORUNDUM representative, or write Dept. S 81-10.

Only CARBORUNDUM

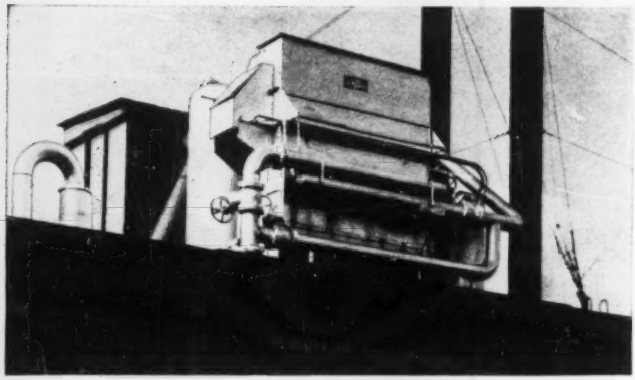
TRADE MARK

makes ALL Abrasive Products ...to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N.Y.

81-10

Direct saving of cooling water expense returns to you the cost of a Niagara Aero After Cooler in less than two years.



How to Get Drier Compressed Air:

It prevents many troubles and saves much expense

● NIAGARA AERO AFTER COOLER cools compressed air or gas below the temperature of the surrounding atmosphere. Therefore you get no further condensation in your lines. You save much in repairs to pneumatic tools and equipment: you save much interruption to production: you save water damage in paint spraying, in air cleaning, in any process where compressed air comes in contact with your materials or parts in manufacturing (sand blasting, for example).

Niagara Aero After Cooler uses evaporative cooling, saving 95% of your cooling water consumption. This saving quickly returns the cost of the equipment to the owner or makes extra cooling water available for other processes.

The Niagara Aero After Cooler produces compressed air with 30% to 50% less moisture than by ordinary cooling methods. Other Niagara equipment provides bone-dry air for processes requiring it.

If you have an air problem or a cooling problem, a Niagara engineer probably has an answer that will improve your process or save you operating or maintenance expense.

Write for Bulletin 93

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities

LETTERS
TO THE EDITORS

Tracking Down Foreign Steel

Does STEEL know of any European steel manufacturers who have offices in the U. S.? We know there is a considerable amount of foreign steel available in this country—at a price—but in most cases specifications are unavailable.

Reference to any foreign company having its own export subsidiary here will be most helpful to us because such subsidiaries permit buyers to deal with legitimate sources, accountable and responsible as to price, delivery and specifications. We are not interested in any of the so-called "steel brokers" we have been able to find to date.

A. J. Rose, vice president
Greenville Steel Car Co.
Greenville, Pa.

● *Almost all steel coming into this country from Europe is handled by brokers and sold at premium prices. Buyers suggest the only way to buy steel direct from Europe is to offer something badly needed there under a barter deal. Be sure, however, to retain reliable inspectors if such an agreement is made.*

Gages: Vital To Industry

Your article on the gage shortage, ("Gage Shortage Threatens Output," STEEL, June 11, p. 47) is vital to our industry. We will appreciate permission to distribute the article to our customers.

Ernest E. Olds, sales manager
Size Control Co.
Chicago

● *Permission granted.*

Idea For Plastic Molding?

Your article, "Models Aid Factory Layout Planning," (STEEL, May 14, p. 86) describes a method of making machinery models in flexible molds formed from a cold-poured plastic. After reading the article, we see applications that would be very useful to Dictaphone in manufacturing some of our short-run tests. We will appreciate any information on sources for this method.

M. B. Whiting, process engineer
Dictaphone Corp.
Bridgeport, Conn.

● *Two Companies supply the material: Luckey Laboratories, Luckey, O., and American Resin Corp., 1730 W. Carroll, Chicago 12.*

Sizing Up Steel Capacity

STEEL's figures and estimate on the following will be appreciated:

What was the production capacity of the steel industry in tons Jan. 1, 1950; Jan. 1, 1951; and what is anticipated on Jan. 1, 1952?

Joseph B. Clay, president
Clay Equipment Corp.
Cedar Falls, Iowa

● *Steel ingot production capacity as of Jan. 1, 1950, was 99,392,800 tons; on Jan. 1, 1951, it was 104,229,630; by Jan. 1, 1952, estimated capacity will be 110,500,000.*

STEEL

THE VEHICLE OF DEFENSE

Without steel there would be little or no movement of men and material . . . there would be little or no defense.

For steel is the stuff of which tanks are made . . . in the hands of trained and spirited men, steel becomes a powerful engine of destruction to the enemies of free America.

Thousands upon thousands of tanks and a proportionate number of tank retrievers are now needed and are on order. The country's rolling mills and forges have the go-ahead to produce the many special steels required for these specialized vehicles.

Weirton Steel Company, pledged to participate in defense measures in any way and to any required degree, is supplying steel on approved allocation to hasten the completion of America's mechanized defense program.

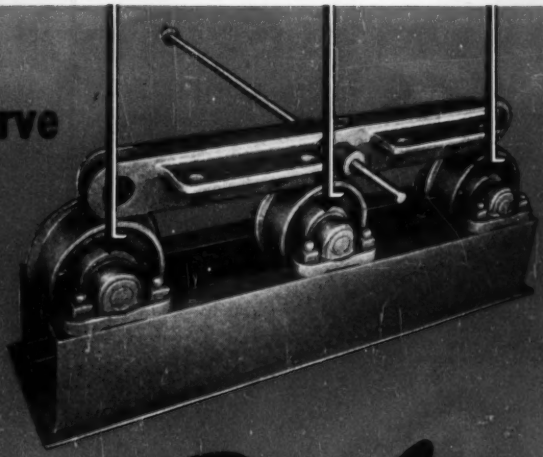
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

NATIONAL STEEL

These Wheels Serve You Best by STANDING STILL



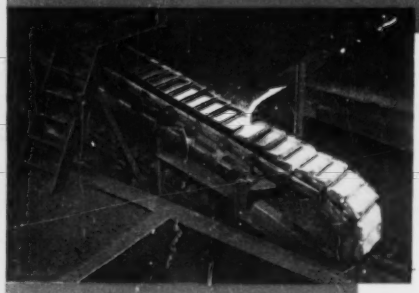
Bailey

STATIONARY WHEEL PIG CASTING MACHINES

Correctly designed for greater production . . . longer service

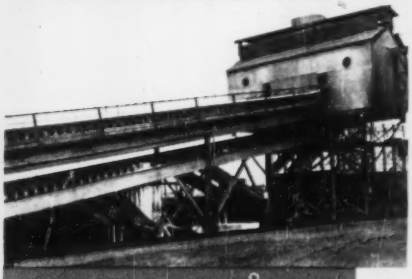
Increased casting capacity, reduced maintenance and operation costs—these are your benefits from the "stationary wheel" design of Bailey Pig Casting Machines. Bailey Machines feature large diameter idler wheels permanently mounted at intervals on the frame. Along these stationary flanged wheels runs an endless chain of moulds. Through this design 80% of the moving parts of conventional machines are eliminated, and the wheels are located as far as possible from casting heat.

Rugged in design and construction, Bailey Pig Casting Machines have been thoroughly proved by service in ferrous and non-ferrous smelters and foundries.



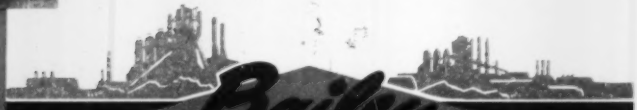
Foundry Type

Completely self-contained, the complete unit includes the machine proper, motor gear unit, variable speed reducer and drive. Only an electrical connection is required for operation. Capacities: 3 to 50 tons. Sizes: 15 to 125 feet in multiples of 5 feet.



Blast Furnace Type

For heavy duty pig casting this machine is built in sizes from 125 to 250 feet long. Supplied with either single or double strand. It runs over 10 inch diameter idler wheels which assure smooth operation at all speeds. Stationary wheel design assures lower power demands, simplified lubrication of the idler wheels, and no vibration while the pig is solidifying.



WILLIAM M. **Bailey** COMPANY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

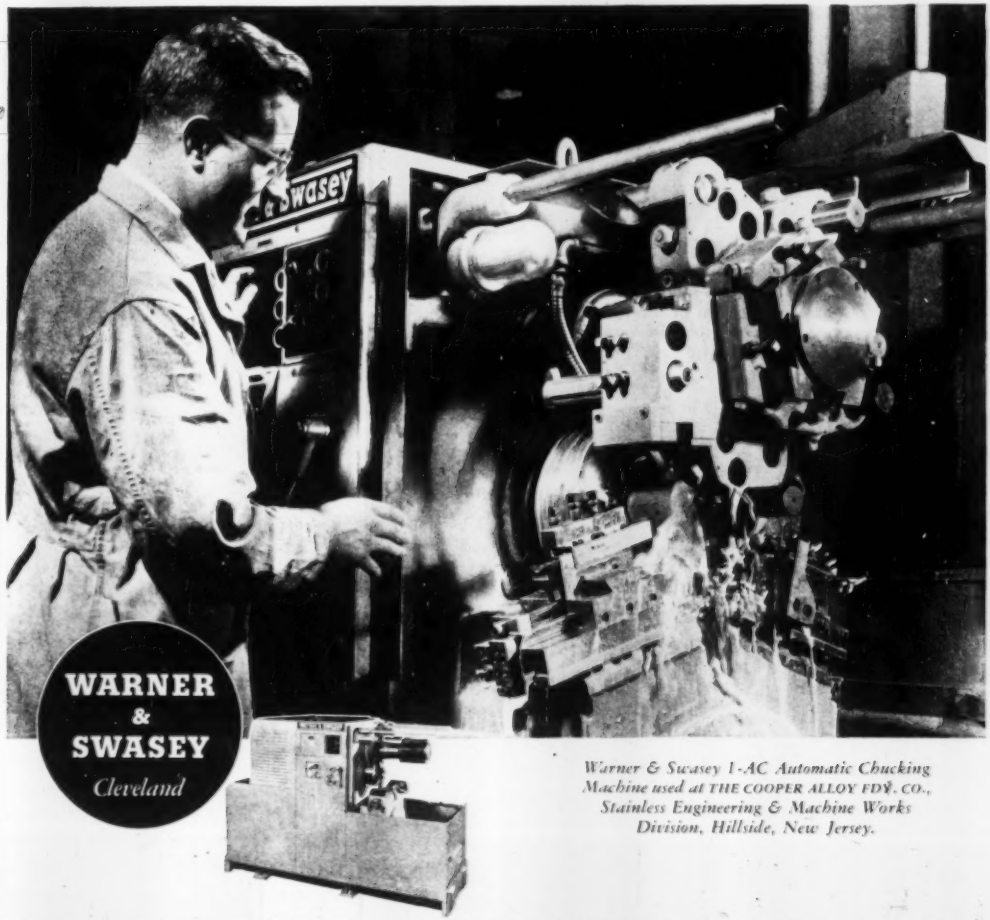
An especially important story today...

PRODUCTION UP 220%—YET WITH FEWER OPERATORS!

● Take a look at the record of Warner & Swasey 1-AC Single Spindle Automatic Chucking Machines, used at The Cooper Alloy Foundry Co., to machine Cast Type 316 Chromium-nickel stainless steel Valve Nuts. These automatic machines increased production 220%, reduced floor-to-floor time 69%, turned out more uniform parts, substantially cut costs per part. Yet they required no additional setup time.

In today's tight manpower market the 1-AC Automatic is taking on increasing importance to management. One man can handle two machines—with each machine turning out substantially more production than an individually-manned, hand-operated machine.

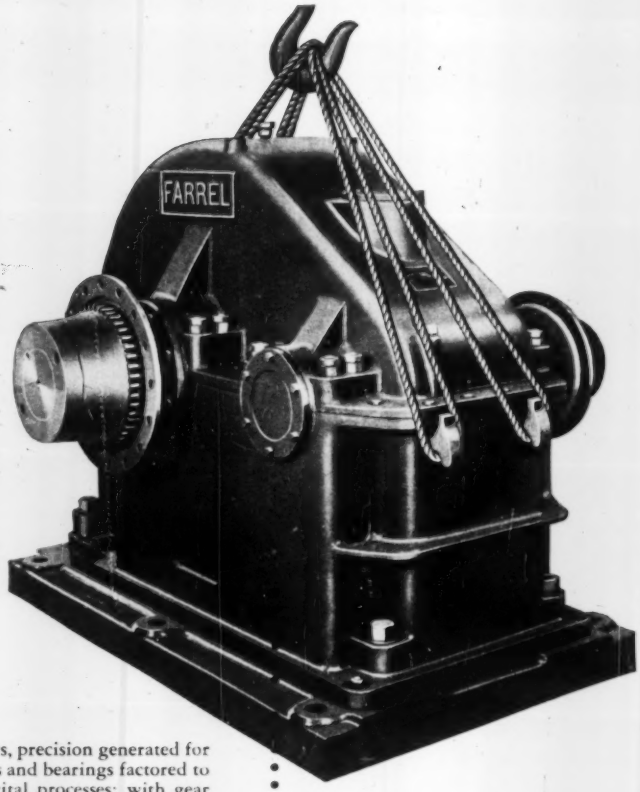
Certain types of machining jobs in your plant can undoubtedly be done better, faster, more profitably—and with less manpower—with the 1-AC Automatic. To find out just how the 1-AC fits into your production setup, call in your nearest Warner & Swasey Field Representative, or write The Warner & Swasey Company, 5701 Carnegie Ave., Cleveland 3, Ohio.



Warner & Swasey 1-AC Automatic Chucking Machine used at THE COOPER ALLOY FDY. CO., Stainless Engineering & Machine Works Division, Hillside, New Jersey.

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

FARREL® SPEED REDUCERS



THEY ARE MADE with Farrel-Sykes gears, precision generated for smooth, quiet operation; with shafts and bearings factored to safeguard against interruption of vital processes; with gear cases proportioned to withstand repeated heavy peak loads. These are standard features of design, incorporated to assure long, trouble-free performance under normal operating conditions.

FOR UNUSUALLY SEVERE SERVICE, THEY ARE MADE with gears, shafts, bearings, and even some housing dimensions, proportioned to meet specific load, speed and operating conditions. Because of this flexibility in design, Farrel speed reducers have provided the solution to innumerable application problems.

WRITE FOR COMPLETE DETAILS. *Ask for a copy of Bulletin 449—no cost or obligation.*

are made to fit your requirements

FB-671

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Cleveland, Detroit, Chicago, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

Farrel-Birmingham®

WIRE ROPE

Production men specify Roebling Preformed for longer life . . . lower costs

FOR EASY HANDLING, extra toughness and service life, there's nothing like Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel—made only by Roebling—gives rope top resistance to abrasion and fatigue. And Roebling Preforming gives you a rope that spools better . . . doesn't tend to set or kink . . . minimizes vibration and whipping.

There is a Roebling wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man help choose the rope that will give you the best, low-cost performance. Further savings may be effected by following his suggestions on installation, use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave. N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

For any kind of metallurgical construction

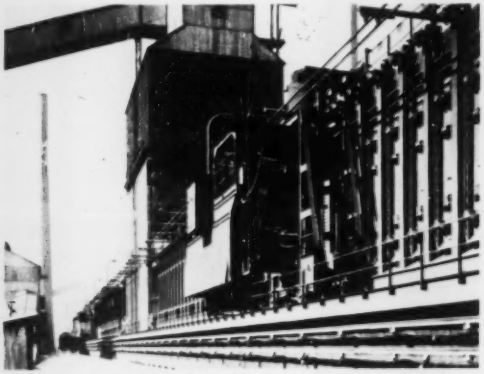
The installations pictured here give some indication of the scope of Koppers Metallurgical Engineering and Construction Services. Our Engineers and Management welcome the opportunity to consult with you.

ALL BRANCHES of the iron and steel industry *can count on Koppers* for comprehensive design, engineering and construction services, because Koppers Company is a specialist in the metallurgical field.

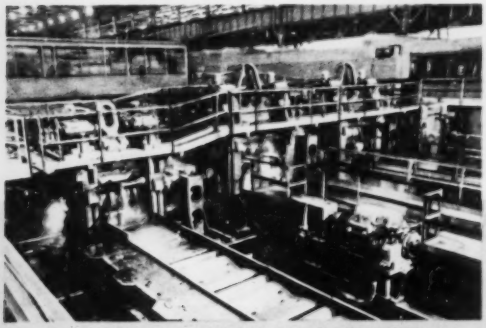
The Engineering and Construction Division of Koppers has long been recognized as a leader in the design and construction of coke-oven plants, auxiliaries and coal chemicals plants.

The Freyn Engineering Department of this Division specializes in the design and construction of blast furnaces, open-hearth furnaces and sintering plants . . . in the engineering of mills, power plants and other steel plant facilities.

Freyn-Designed and Constructed Sintering Plant. The sintering process permits *maximum* utilization of iron-ore fines and blast-furnace flue dust; also, it increases the pig-iron production of existing furnaces.



These 106 new Koppers-Becker Underjet Coke Ovens carbonize approximately 2,600 net tons of coal per day. Built in two batteries, they are equipped with Waste-Gas Recirculation and Blast-Furnace Gas Underfiring Equipment.



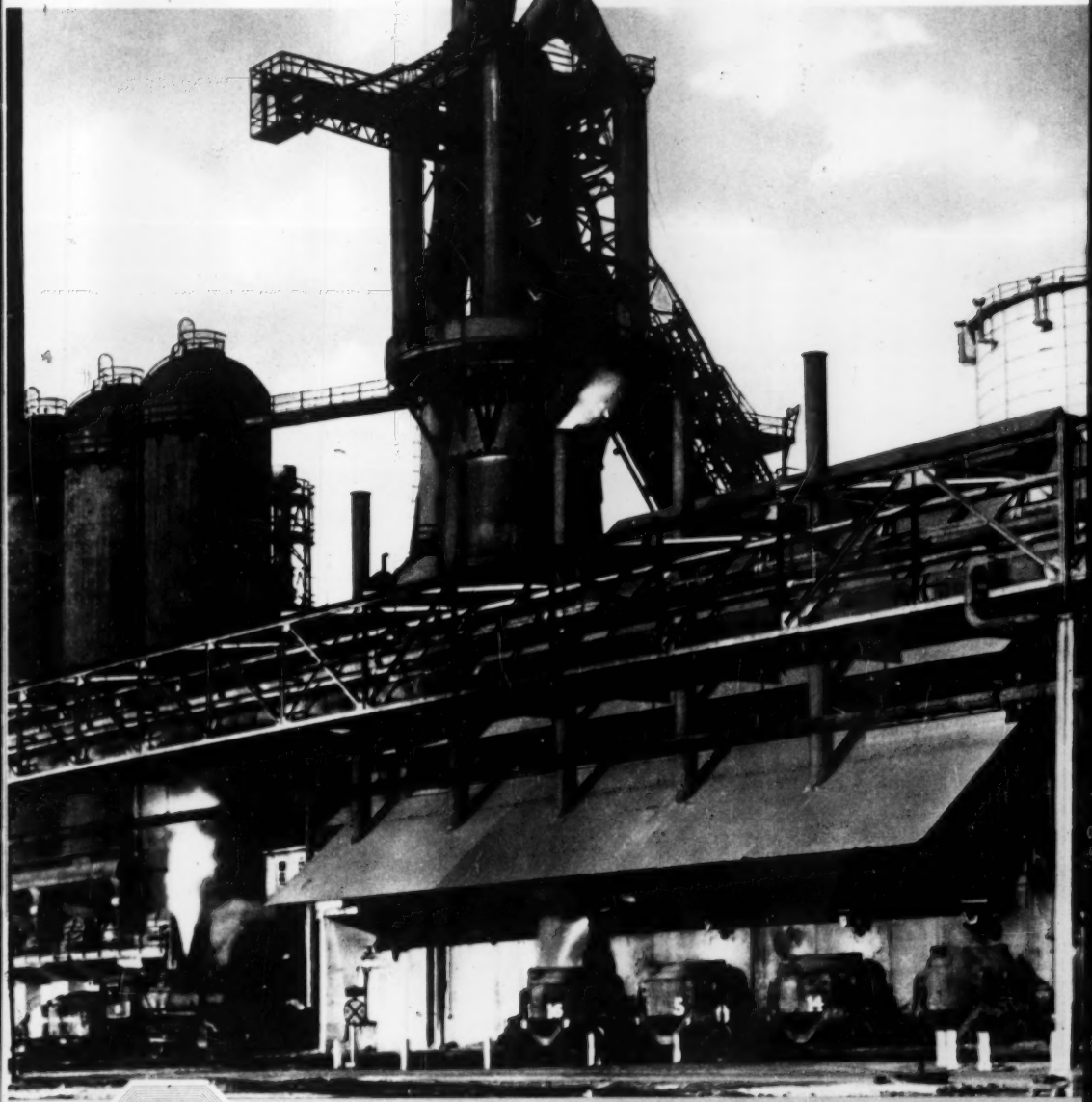
Freyn-Designed Structural Mill and Traveling Tilting Tables.

Freyn-Designed and Constructed Open-Hearth Furnaces.

This plant was constructed by Koppers for the recovery of ammonium sulphate, tar, light oil and pure benzol products from the carbonizing of 1,050 tons of coal daily.

YOU CAN COUNT ON KOPPERS!

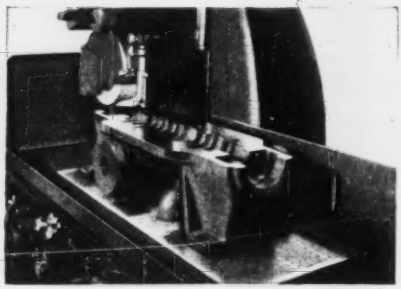
Typical Freyn-Designed and Constructed Blast Furnaces and Stoves.



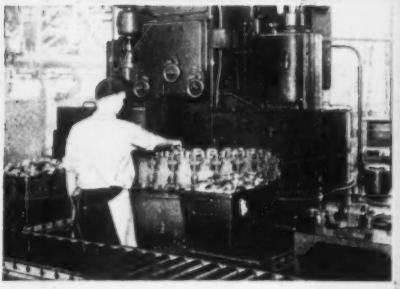
KOPPERS *Engineering and Construction Division*

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.

WHERE THERE IS A FLAT SURFACE TO GRIND THERE'S A MATTISON TO GRIND IT.



40 hours before — now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder.



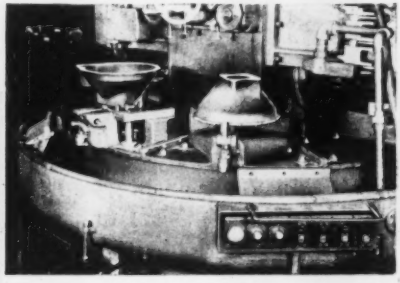
700 connecting rods per hour, using 40 station fixture to finish grind crank and wrist pin end of assembled rod with Mattison No. 72 Grinder.

With the addition of the production grinding machinery formerly made by the Hanchett Manufacturing Company, Mattison is now in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced engineers are available to give you best production efficiency, finish and tolerances, with Mattison machines.

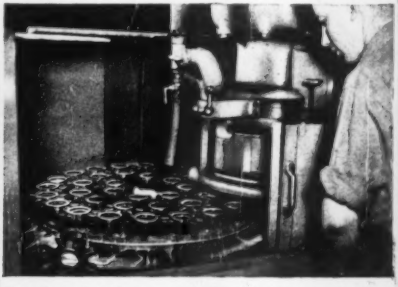
For any flat grinding ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalogs on any of the types shown or if you would like a copy of the general bulletin, let us know and we'll gladly send them to you.

Grinding Cast-Iron Cams — 5" diameter, 1½" thick — stock removal, each side .030". Production 120 surfaces per hour on Mattison (Hanchett Type) Rotary Surface Grinder.



200 Transmission Case surfaces ground per hour on Mattison (Hanchett Type) Rotary Automatic Grinder. A special 8-station mechanical fixture permits one operator to grind each end of this large 35 lb. casting, flat and parallel. Stock removal .050".



320 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder.

MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

Why monkey around with inferior tubing?

Bundyweld Tubing, double-walled from a single strip. Exclusive, patented beveled edge affords smoother joint, absence of bead, less chance for any leakage.

Why fuss around with the costly production delays, poor performance and other monkey business an inadequate tubing can get you into?

Let Bundyweld show you what tubing features really are!

This multiple-wall type of Bundy® tubing is double-rolled from a single strip. No other like it. It's extra-rugged, easy to form and highly resistant to vibration fatigue. It's thinner walled, yet stronger walled, won't leak under pressure or burst under normal strain.

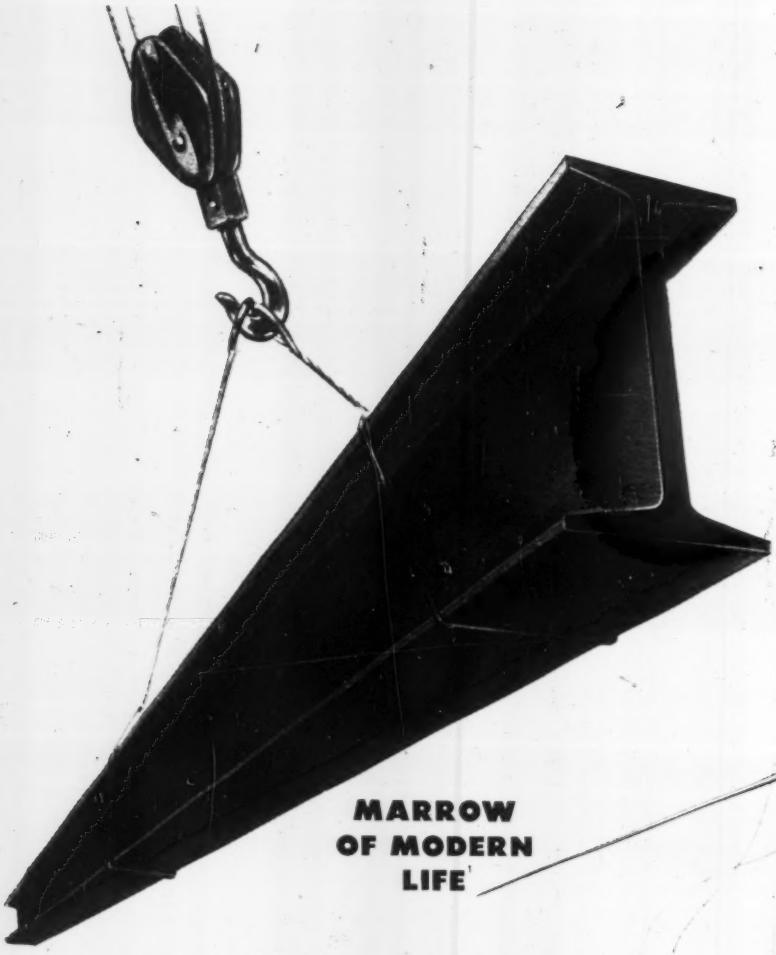
For help on any application of small-diameter tubing, why not check Bundy Tubing Company today?

Bundy Tubing Company

DETROIT 14, MICHIGAN

World's largest producer of small-diameter tubing

AFFILIATED PLANTS IN ENGLAND, FRANCE AND GERMANY



MARROW OF MODERN LIFE

From the housewife's needle to the builder's I-beam, steel is part of every phase of modern life. The mills producing it are thundering at ever higher speeds, speeds made possible by close co-operation between designers and engineers in every industry which supplies components for the strip mills, blooming mills, rolling mills which are turning out ever-mounting tonnages. For many years, SKF has worked hand-in-hand with the steel industry, and has met and often anticipated its needs for the right bearing in the right place. 7268

SKF

BALL AND ROLLER BEARINGS

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

integrity • craftsmanship • metallurgy
tolerance control • surface finish
product uniformity • engineering service
field service

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA. — *manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

Loyalty Test is given every Bristol Brass alloy, to make sure it is faithful both to customers' specifications and to Bristol's frankly fussy ideas on quality. Here, in Bristol's modern laboratories, a platinum screen covered with electro-deposited copper is weighed to determine copper-content of a test piece. And here, *many* eyes watch constantly to see that all sheet, rod and wire going out of this mill is made truly "Bristol-Fashion." The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

Is this the **INFORMATION** *you are looking for?*

SEYMOUR No. 950
Grade A Phosphor Bronze

95% Copper • 5% Tin

Outstanding characteristics of Seymour Phosphor Bronzes are their great toughness, ability to retain resiliency under countless flexures, resistance to wear, good electrical and thermal conductivity, good bearing qualities, high resistance to corrosion. Write for your copy of SEYMOUR PHOSPHOR BRONZE containing important data on sheet, wire and rod.

SHEET SIZES

Gauge	#36B&S (.0050) and heavier
Width	1/8" to and inc. 14"
Lengths	Commercial
Circles	2" to 14" in dia.
Coils or Rolls	Gauges .090 and thinner

SPECIFICATIONS

U.S. Navy	46-B-14
Federal	QQ-B-746
A.S.T.M.	B-103-42T
A.M.S.	4510
S.A.E.	77

USES

- Springs
- Diaphragms
- Fuse Clips
- Lock Washers
- Perforated Sheets
- Thermostatic Controls
- Microphone Assemblies
- Electrical Devices

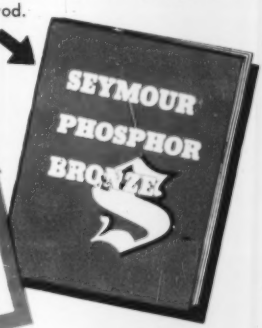
TEMPERS

	B. & S. Numbers	Tensile Strength Lbs. Per Sq. In. Min.	Max.
Soft	Hard	40,000	55,000
Half Hard	0	55,000	70,000
Hard	2	72,000	87,000
Extra Hard	4	84,000	98,000
Spring	6	91,000	105,000
Extra Spring	8	96,000	109,000
	10		

Based on Tests of Sheet .040 Thick

PROPERTIES

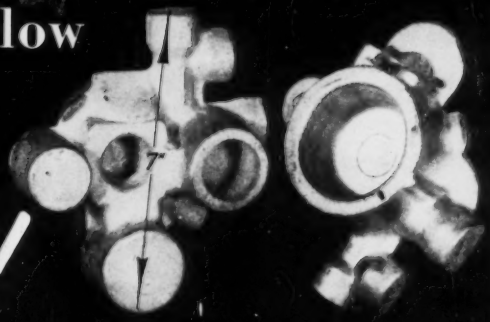
	Spring Temper	Soft
Elongation % in 2"	1.5	50
Rockwell B 1/16" Ball 100 KG Load	95	30
Density—lbs. per cu. in.	.322	
Elec. Cond. % I.A.C.S. at 20° C.	16.5	
Thermal Cond. BTU	47	
Polishing	Excellent	

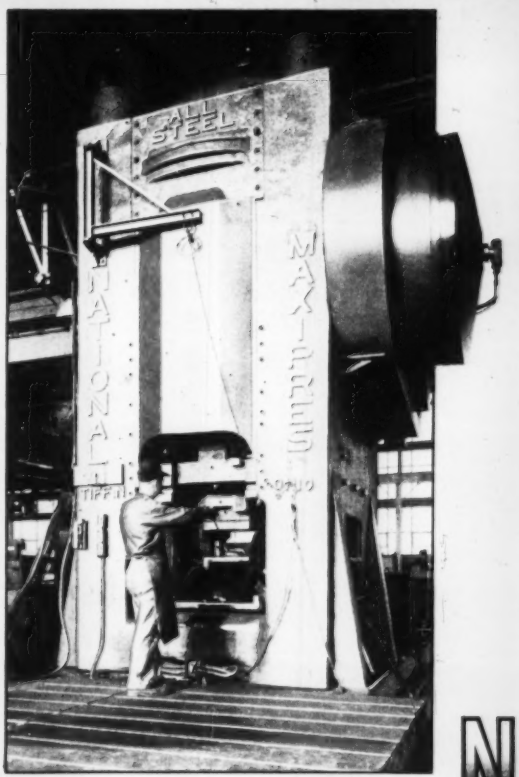


THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONN.

SEYMOUR

This Intricate Brass Forging Made in One Blow on a NATIONAL 6A MAXIPRES!





Forging operation at Mueller Brass Co., Port Huron, Michigan

● The Mueller Brass Co., Port Huron, Michigan, makes this difficult brass valve forging in only one blow at a rate of 300 forgings per hour on a National No. 6A MAXIPRES. The original billet measures 3-9/16 inches round by 5-7/16 inches long. (16.6 lbs.)

Successful master-forgers of brass and bronze, and pioneers in the development of specialized forging techniques, the Mueller Brass Co. relies upon the dependability of five MAXIPRESSES for a large share of its forging output.

If you have a forging problem—hot or cold, ferrous or non-ferrous—let us help you with it. Send us prints or a sample of the part you wish to forge. Better yet, visit us. No obligation.

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MACHINERY COMPANY
TIFFIN, OHIO.

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES—MAXIPRESSES—COLD HEADERS—AND BOLT, NUT, RIVET, AND WIRE NAIL MACHINERY

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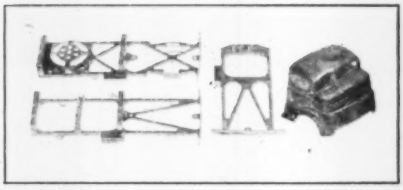
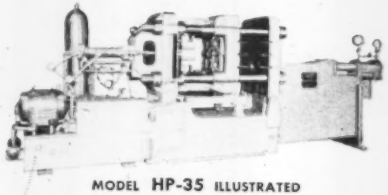
UNGENTLE YOUNG HANDS put famous Structo trucks, trailers and steam-shovels through their "live-action" paces again and again. Toys have to be tough to take that. Structo *is* tough. Employing KUX die casting machines, Structo gets lightweight, structural castings of extra-ruggedness . . . to build toys that last a child-time of pleasure!

Is YOUR PRODUCT conditioned for the treatment it has to take? Quality die castings often make a tremendous difference in costs and saleability. KUX, first name in die casting machines, can make that difference for You!

Write for illustrated catalog showing complete line of KUX Die Casting Machines.





MODEL **HP-35** ILLUSTRATED

Hydraulically operated die casting machine for production of aluminum castings.

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MEN AND MACHINES *Serve You* FAITHFULLY

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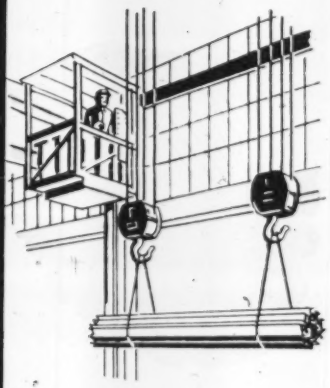

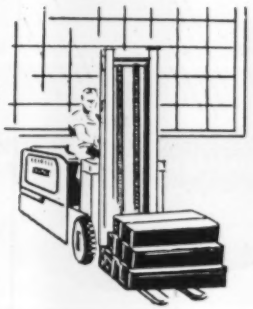

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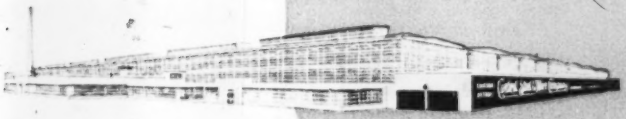
At Central Steel each one of the large bays is equipped with two electric overhead cranes manned by experienced operators. One unloads incoming material from the rolling mills while the other quickly moves stock from scales to cutting equipment to waiting trucks at the loading docks. These overhead cranes and the efficient lift trucks used to handle shorter lengths of material and smaller loads help to slash time between our order desk and fast, dependable delivery to your plant.

Constantly expanding facilities make Central Steel your best source of materials . . . you can be sure of the fastest service on all metals when you order from any of our four strategically located warehouses.



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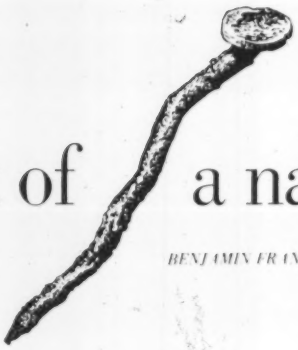
"For the want of a nail the shoe was lost,
For the want of a shoe the horse was lost,
For the want of a horse the rider was lost,
For the want of a rider the battle was lost,
For the want of a battle the Kingdom was lost . . .

and all for want of a nail"



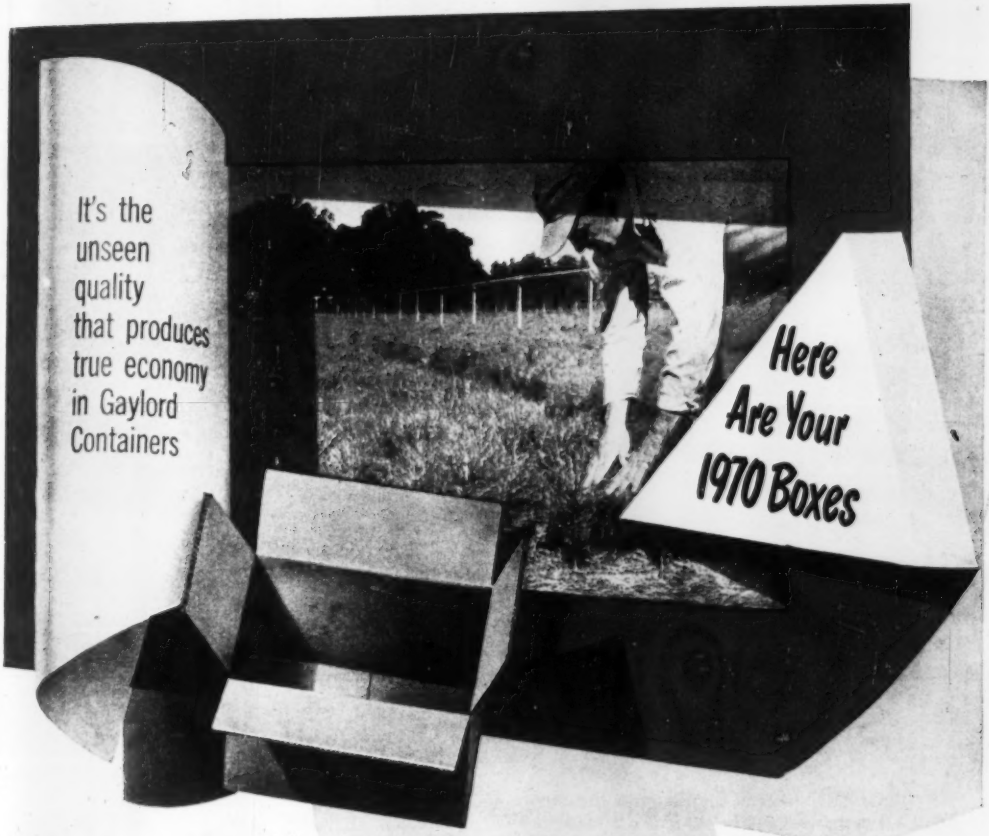
BENJAMIN FRANKLIN, "Poor Richard," 1758

The fate of nations often hangs on little things. Take this rusty old nail. It symbolizes thousands of tons of worn-out machines and broken parts lying useless in our plants, factories, farms, and homes—scrap steel desperately needed today by our steel mills.

You can help make this nail, and all the other scrap you can collect, go to work again . . . in new steel for ships, tanks, and guns required for defense purposes.

So survey your plant now for every last bit of scrap. Then get it to your scrap dealer promptly. This will not only help assure the nation of the arms needed to preserve our freedom, but it will also mean more steel for your own products tomorrow.

ELECTRO METALLURGICAL COMPANY, a Division of Union Carbide and Carbon Corporation.



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FOLDING CARTONS
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From the moment the seedling is planted by Gaylord foresters until the shipping container is delivered, every step in growing and manufacturing is supervised by Gaylord specialists. It's this kind of experienced control that enables Gaylord to build boxes of unsurpassed quality for many of the country's largest users.

Gaylord Boxes

262

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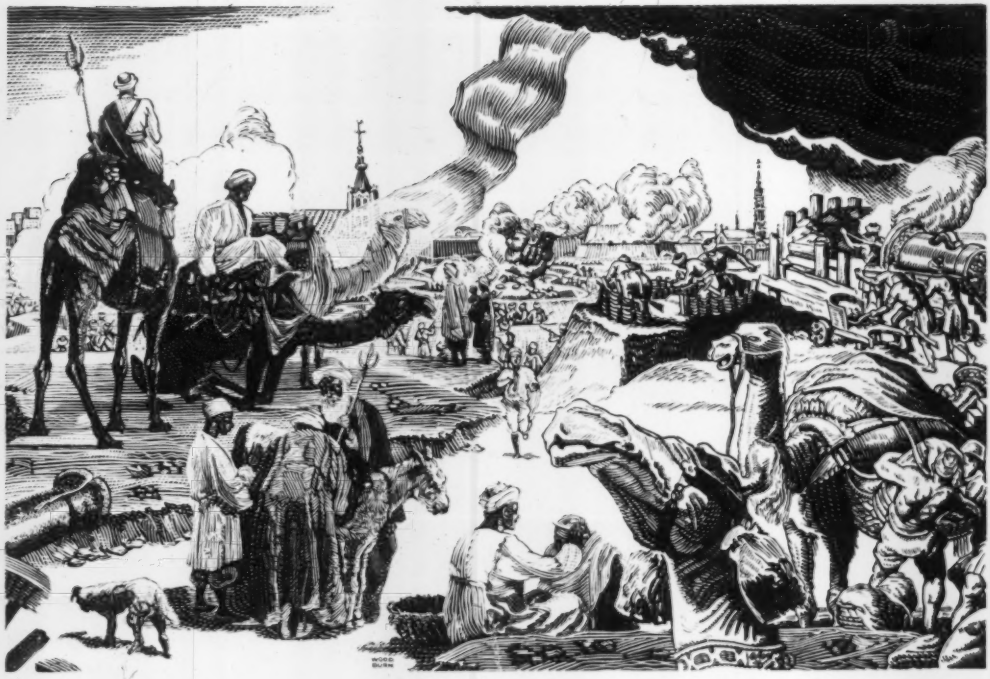

Steel saved civilization at Vienna

MODERN history begins with the record of conflict between Christians and Moslems--six centuries of wars that opened with the Crusades and saw the Turks capture Constantinople in 1453.

More than 100,000 Turkish janizaries and cavalry besieged Vienna in 1683. For two months, to quote the diary of an eye witness, "The enemy continued playing their cannon and granadoes. But the city walls were strong, Christian cannon were bigger and more numerous and ammunition more plentiful." Finally came a day when the officer's journal reported, "The enemy did not play their cannon so fast. It was confirmed that they had no great provision of bullets, inasmuch as they shot back not only our bullets, but also pummels of swords and all sorts of iron and stones."

At last a great Christian relief army was assembled. "They made an attack in the best order that ever army did. The enemy, forced always to give back, were put all into confusion. They betook themselves to flight, leaving all their provisions, ammunition, cannons and tents --the greatest part rendered unfit for farther use by our great guns."

Never again did the Turks seriously menace Christendom. Western civilization had been saved once more by its supremacy in the use of iron and steel. To aid our survival America's free private industry is producing steel at the highest rate ever known--and still expanding. The question remains--Will America use enough of this tremendous steel production to guarantee the continued supremacy of Western, Christian civilization?---We believe the answer is yes!

YOUR SCRAP IS NEEDED — YOUNGSTOWN

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

Line-O-Power

STRAIGHT LINE DRIVES

...for quality... economy... efficiency...

Line-O-Power Double Reduction

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QUALITY that starts with Duti-Rated, high hardness, precision helical gears, assembled into rugged cast housings of compact, streamlined design.

ECONOMICAL to buy because the latest, most accurate high production machine tools assure rapid production with exceptional accuracy for long wear life. Economical to operate because simplified construction, minimum number of moving parts, direct splash lubrication, quality workmanship—all hold maintenance to a minimum.

EFFICIENCY—Straight line design with Duti-Rated helical gears gives efficiencies of 96%, or higher.

Line-O-Power Drives are available in double or triple reductions for capacities from 1 to 200 h.p. with ratios from 5 to 1 up to 238 to 1.

FOOTE BROS. GEAR AND MACHINE CORPORATION
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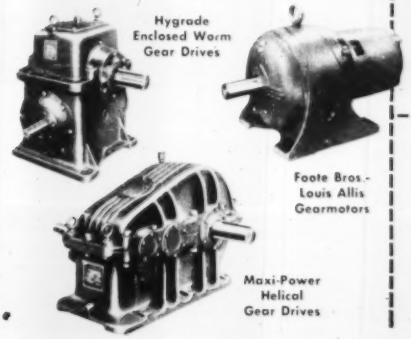
FOOTE BROS. manufactures a complete line of enclosed gear drives to meet any requirement.



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Please send me a copy of Bulletin LPB on Foote Bros. Line-O-Power Drives.

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Seeking help in fabricating tubular parts?

If you are now called upon to supply tubular parts fabricated of non-ferrous tube, look in on the specialized facilities available to you here at Wolverine.

Regardless of how you may be set up for producing the parts you contemplate, you'll find it a definite advantage to consider Wolverine's skill and knowledge of fabrication.

You have at your command over three decades of tube-manufacturing and related fabrication experience that can help you immeasurably.

We can supply the complete tubular parts or show you the most efficient ways of fabricating the parts in your own plant.

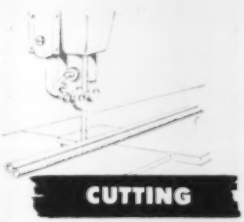
The illustrations here suggest only a few of the many operations that we are particularly equipped to render assistance to you.

WOLVERINE TUBE DIVISION

Calumet and Hecla Consolidated Copper Company

INCORPORATED

Manufacturers of seamless, non-ferrous tubing



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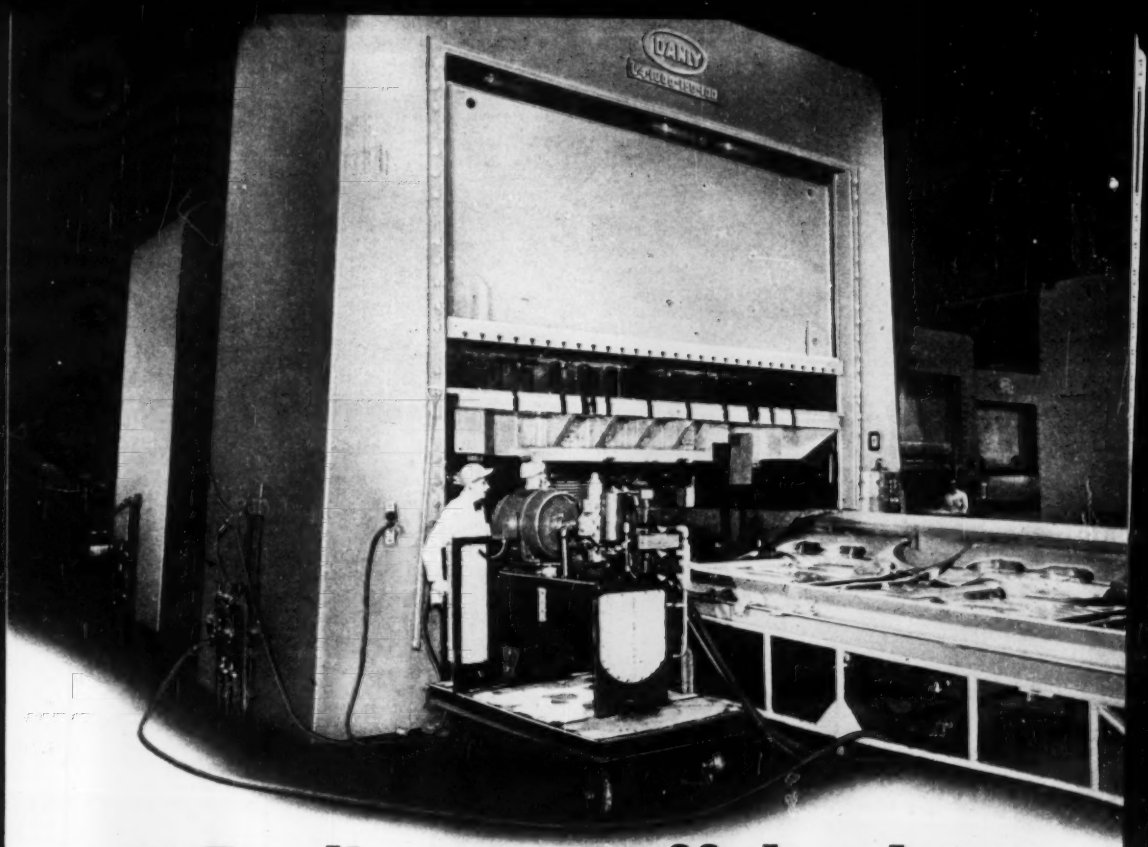
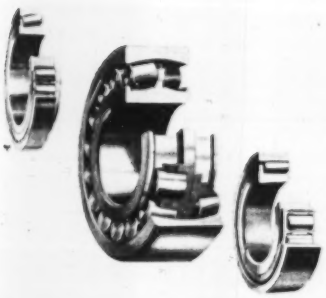


at Ford's new Buffalo plant

...Danly Presses are Torrington Bearing-Equipped



At the Ford Motor Company's new Buffalo plant, several Danly Underdrive Presses—ranging from 600 to 1000-tons capacity—are producing stampings for Ford, Lincoln and Mercury cars. In each press, nine Torrington Bearings team up to deliver smooth ram power and help reduce press downtime.

Spherical, Tapered and Radial Roller Bearings, and NCS Type Needle Bearings, are used in the driveshaft assembly and intermediate gear driveshaft of the new presses, which embody the latest developments for high-speed production and easy maintenance.

Why not include the advantages of Torrington Bearings in your equipment. Our engineers will be glad to help you.

THE TORRINGTON COMPANY

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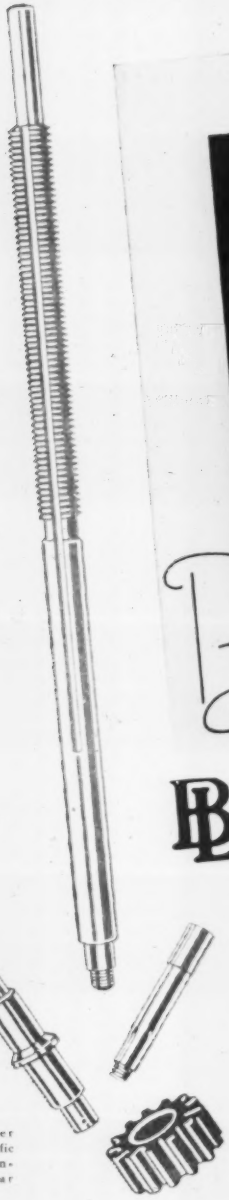
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • BALL • NEEDLE • NEEDLE ROLLERS



Ask for further details on specific uses of Strain-Tempered Bar Steels.

Balanced PHYSICALS

B&L *Strain*-TEMPERED BAR STEELS

. . . these specially processed Cold Finished Bars may be the answer to some of your most critical manufacturing problems. They are "conditioned to the job" by closely controlled furnace treatments that provide a more workable steel with added production advantages.

The tensile strength may be greatly increased while holding a satisfactory balance of ductility. Hardness and wearability may be improved to eliminate heat treating. Cold working strain may be relieved to minimize distortion and save costly straightening operations.

B&L Strain-Tempered Bar steels are economically adapted for ordnance and munitions parts, and many industrial products, where extremely close tolerances and restricted physical specifications must be met.

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B&L SINCE 1891

Method IA for protecting a precision part: first the part is completely immersed in rust preventive; after the rust preventive has set, the part is enclosed in a pre-cut wrapper; then the part is lap-dipped in a special sealing compound.

Method IA for protecting a carton: first the part is placed in the carton; next the carton is enclosed in pre-cut and folded strips of wrapper and sealed at all seams; then the package is lap-dipped in sealing compound and the carton is safe for shipment.

Dearborn . . . headquarters for packaging to

government specifications

If you are packaging machines and equipment to government specifications, Dearborn can help you.

Illustrated above are graphic demonstrations of the widely known Method IA . . . typical uses of the government specified packaging materials that are available from Dearborn. Broadly, these government specified materials include rust preventives, wrappers, sealers, case liners and fingerprint neutralizers. Other Dearborn materials include cleaners, rust removers and VPI, the specially treated paper that gives off an invisible protective vapor.

Why not discuss this important matter with a Dearborn packaging engineer? He will gladly assist you in setting up a packaging procedure that fully meets government specifications . . . one that will assure the corrosion-free arrival of your products at their destination.

Please Note Our New Address

DEARBORN CHEMICAL COMPANY
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This booklet will help you

The new edition of "Preventing Corrosion in Export Packaging" gives you: (1) current government specifications; (2) cleaning methods; (3) approved packaging methods; (4) how to apply rust preventives; (5) how to wrap, seal and dip parts; and (6) other valuable information with step-by-step picture stories. Write for it today.

Dearborn Chemical Company, Dept. S
Merchandise Mart Plaza, Chicago 54, Ill.

☐ Please send a copy of "Preventing Corrosion in Export Packaging."
☐ Have a Dearborn Representative call.

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Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE

Photo courtesy American Machine & Foundry Company

The acid test of a push-button washing machine

"We need a pickling machine like the new automatic washing machines."

This was the idea that came to a manufacturer. And for pickling small parts like bolts, screws, washers — why not a machine that takes a load and puts it through the pickling cycle under automatic control?

A rolling, tumbling action would assure thorough cleaning of each piece. The process would be faster and more effective . . . yet would require less employee time.

The heart of the machine would be the cylinder or basket that carries the load, and the problem was how to make a cylinder that would stand up.

Here was need for a material that would neither be eaten away by the pickling acid, nor affected by the hot and cold water sprays. This metal would have to stand the tumbling of sharp-edged pieces over the ribs of the basket as it revolved.

There would be strain, too, from the off-center load, because the basket turns on a tilted pivot. Fabrication would be important — a sound welding job essential.

The designer realized the rigorous nature of these demands — so he selected Monel. That highly successful pickler you see above is the result.

Your *own* metal problem . . . present or future?

If it's complicated by corrosion, by temperature extremes — high or low, by whatever difficulty, the solution may be one of the INCO Nickel Alloys. Let our engineers help you find out. You'll find them anxious to aid in your problem . . . whether it concerns defense at present, or production in the future.

Nickel Tips

Booming Life Buoys. Explosions in marine navigation beacons illuminated with acetylene were causing concern and mystification. Investigation revealed that the acetylene gas, on contact with copper vent tubes, was forming copper acetalide—a highly unstable compound. Monel vent tubes eliminated the trouble.

• • •

Co-Axial Wire, of copper sheathed in nickel, offers properties unmatched by any single metal. This jacketed conductor has 70% the electrical conductivity of solid copper, with greater strength and toughness, and heat- and corrosion-resistance of Nickel.

• • •

Electrical Control Boxes are assembled faster through silver-brazing the whole unit at one step — thanks to Inconel wire. Guard springs around the capillary tube can now go through the brazing temperature without losing their temper because they are made of Inconel.

• • •

A Soap Maker was exasperated with the hardened steel doctor blades on his soap flaker roll. Every hour he had to hone the blades; every three days, he had to regrind them. Then he tried doctor blades of "K" Monel. He found that the "K" Monel blades had to be honed only once every 24 hours — and lasted 27 days before they needed regrinding.

• • •

Standard Alloys for Special Problems is a new 16-page booklet packed with data on the properties of the different Inco Nickel Alloys, interesting applications, mill forms and sizes supplied as standard. Your copy is waiting for your request.

EMBLEM OF SERVICE

INCO TRADE MARK

The International Nickel Company, Inc.

67 Wall Street, New York 5, N. Y.

The Metalworking Outlook

July 2, 1951

Act Now on CMP

To help ease the difficulties of shifting to a Controlled Materials Plan, notify your steel, aluminum or copper suppliers immediately as to what your CMP allotment and symbol numbers are. Those numbers can then be applied to any orders you already have on their books for September or later delivery. If you do not give the mills your new CMP numbers at once, you may find your shipment will be delayed in a snarl of red tape.

Where Steel Will Go

An estimated 20.8 million product tons of steel will be available in the third quarter, NPA says. That will be divided this way: 1,760,000 tons for direct military; 15,660,000 tons for defense-support; and 3,380,000 tons for the free market. Although the direct military take of total output is less than 9 per cent, the bulk of third quarter production of some products will go to the military. Some 75 per cent of all stainless and high alloy output in the next three months goes for direct military use.

Needed: Still More Scrap

If the present rate of purchased scrap consumption is continued, the steel industry will need 36 million tons in 1951, not 32.5 million as originally estimated. That is 6.5 million tons more than the 1950 use of 29.5 million tons. National Production Authority says that during the first four months of 1951, scrap inventories dropped about 1 million tons. But in May scrap recovery improved to the extent that inventory loss in that month was held to 13,000 tons.

Paradox in Prices

There's a paradox in prices now. A few makers of producers' goods are lowering some of their quotations even though price ceilings don't force them to. The explanation: Their competitors have been hit by twists in the price rules and have been forced to lower; some manufacturers who do not legally need to cut feel they must to keep in line with their competition and to keep their customers as unruffled as possible.

Watch Salary Schedules

Watch the salary schedules of your top executives. The Bureau of Internal Revenue may challenge them if there have been marked increases in the past year. If you have boosted the stipends for your officials, here's the evidence you should have to support the gains, according to Harry H. Rose, a certified public accountant and tax man in Cleveland: Show that the amount paid is no more than is paid for like services by like enterprises; show unique or specialized

Production Engineering News—p. 73 The Market Outlook—p. 131

ability of the employee; show difficulty of replacement of the employee; show the growth of your business that requires greater administrative skill.

Living Costs Rise

The Bureau of Labor Statistics' cost-of-living index rose 0.4 per cent between mid-April and mid-May. The increase is not alarming, but it may be enough to force more activity from the Office of Price Stabilization which had been turning increasingly to a laissez-faire policy as long as prices remained steady or declined. The overall index on May 15 was 8.9 per cent higher than just before Korea and 9.5 per cent above May, 1950.

Defense Spending Up

The Department of Defense obligated $29.5 billion for the procurement of major equipment, supplies, military construction and expansion of production facilities in the first 11 months of the 1951 fiscal year which ended June 30. Of that sum, $23.8 billion went for aircraft, ships, tanks, weapons, ammunition and other hard goods; $2.3 billion for military construction and facilities expansion; and $3.4 billion for clothing subsistence and petroleum products.

Look Before You Leap

Look before you leap into defense business. Some companies are signing hastily considered subcontracts that are going to bring trouble later. Most of the difficulty is on prices. Many firms apparently reason: We're going to be renegotiated later, so let's not quibble on price. It pays to consider carefully your pricing decision now. If your judgment is good, you will save the agonies of renegotiation altogether. If it's bad, you'll be hit hard by renegotiators if the price proved too high, but will get little sympathy if it proved too low.

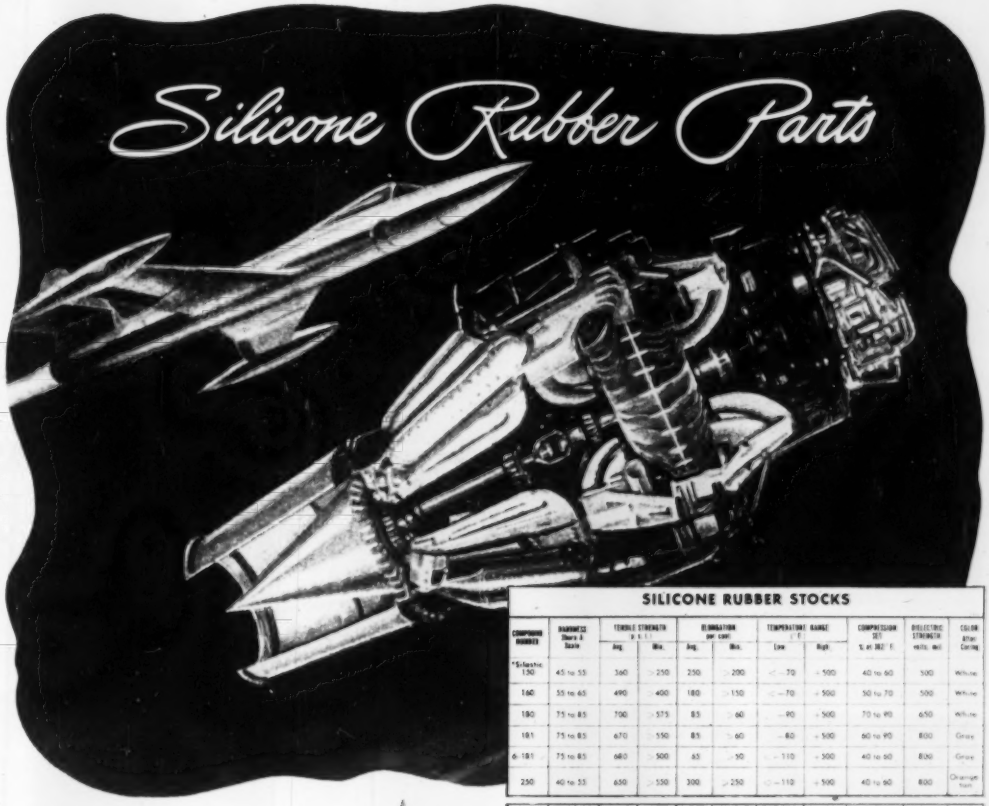
What's Ahead in Rearmament

Department of Defense will distribute its second revision of "The Directory of Metalworking Machinery" about Aug. 1 . . . NPA may divert some machine tools to defense contractors, even though their orders are far down the list . . . Fairchild Engine & Airplane Corp. will build the C-119 Packet for the Air Force in government facilities at O'Hare International Airport near Chicago . . . The biggest gray market in steel in history will be attempted this fall, warns Robert H. Winn, assistant general counsel of NPA.

Here and There in Industry

Business will continue at a high rate for the rest of 1951 (p. 45) . . . The proposed tax on advertising is a dead duck (p. 49) . . . McLouth Steel Corp. plans a $96 million expansion program (p. 49) . . . Republic Steel Corp. has received its first shipment of rich Liberian iron ore (p. 56).

Silicone Rubber Parts



SILICONE RUBBER STOCKS

Compound Number	Hardness Shore A Scale	Tensile Strength p.s.i.		Elongation per cent		Temperature Range °F.		Compression Set % at 302° F.	Dielectric Strength volts, mil	Color After Curing
		Avg.	Min.	Avg.	Min.	Low	High			
*Silastic 150	45 to 55	360	250	250	200	−70	+500	40 to 60	500	White
160	55 to 65	490	400	180	150	−70	+500	50 to 70	500	White
180	75 to 85	700	575	85	60	−90	+500	70 to 90	650	White
181	75 to 85	670	550	85	60	−80	+500	60 to 90	800	Green
6-181	75 to 85	680	500	65	50	−110	+500	40 to 60	800	Green
250	40 to 55	650	550	300	250	−110	+500	40 to 60	800	Orange-tan
**G-E RTV 81223	40±5		800		400	−85	+520	65 to 75	480	†
**G-E RTV 81271	50±5		800		250	−85	+520	65 to 75		†

*Registered Trade Mark of the Dow Corning Corporation.
**Specifications listed for this stock are based on cure of 24 hrs. 480° F.
†General Electric silicone rubber can be tinted in a choice of colors.

FOR EXTREME HIGH AND LOW TEMPERATURE APPLICATIONS

ONLY SILICONE rubber parts withstand the severe temperature conditions encountered in whistling, speeding, supersonic jets. These same SILICONE rubber compounds are available for application in transformers, aircraft and marine instruments, internal combustion engines, motors, and generators as well as chemical and electrical equipment.

ONLY SILICONE rubber parts retain their desirable physical, chemical and dielectrical properties within a temperature range of —110° to +500° Fahrenheit. These parts feature excellent resistance to weathering, oxidation, ozone and many chemicals. SILICONE parts advantageously replace many special metal constructions forced upon design engineers by the limited thermal stability of organic rubber compounds.

STALWART is prepared to mold, extrude, punch, and lathe-cut precision SILICONE parts engineered to meet individual requirements as well as S.A.E. and A.S.T.M. specifications.

Write today for the new 16-page, illustrated catalog Number 51SR-1 for additional details.

154 SR

STALWART RUBBER COMPANY

7167 NORTHFIELD ROAD • BEDFORD, OHIO

MORE STEEL
Something About Warehouse Ways of Improving Your Steel-Getting Chances
RELIANCE STEEL DIVISION
DETROIT STEEL CORPORATION

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Two Speeches

Those who heard Defense Mobilizer Charles E. Wilson address members of the National Industrial Advertisers' Association in New York last Monday were impressed with his realistic report of progress in defense mobilization and the sincerity of his concern over certain bottlenecks in the program.

He feels that good progress has been made, but that this is not fully evident because production still is largely in the tooling up stage. "Certain aircraft companies," he said, "are behind with their schedules because they cannot get a sufficient number of tool and die makers, machine tool designers and builders, aeronautical and electronics engineers. The blame here lies partly in the fact that some civilian manufacturers still are designing new models and in so doing are using skilled men who should be working in the defense program. The time has come when industry should scrap the idea of new seasonal designs in automobiles, dishwashing machines, vacuum cleaners or other nondefense items whose 1950 design is plenty good enough."

Here is a positive signal from a man in high authority—a man wholeheartedly sympathetic to industry's problems—that it is time to accelerate the transition from peacetime to defense activity. Most manufacturers will accept this signal for what it is—a sincere statement of a course which must be pursued if the defense mobilization program is to go into high gear as planned.

Unfortunately, many who believe in Mr. Wilson and who know that his suggestion to accelerate the shift to defense production is right are confused by the failure of others in government to take defense problems seriously. On the same day Mr. Wilson was talking to industrial advertisers, President Truman was speaking at a dedication of a Clinical Center at Bethesda, Md. He extolled the old Truman-Ewing socialistic health plan as if it were the current No. 1 objective of the nation.

The persistence with which the President and his closest associates cling to reckless unessential government expenditures and half-baked socialistic objectives makes Mr. Wilson's difficult job more difficult.

How wonderful it would be if he could be given sincere government support!

E. C. Shaner

EDITOR-IN-CHIEF

OUTLOOK IS GOOD, BUT: In collecting material for this publication's midyear forecast of business conditions, the editors encountered sharp differences of opinion among experts. An impressive majority believes we will enjoy a good second-half. Reasons: Heavy defense spending, boom in producers' goods sales, inflation. A minority, consisting largely of people associated with consumer durable goods, believes curtailments traceable to government edict will restrict activities in their sizable industries to the point where they will depress

the entire economy of this country.

Statistics seem to support the view of the optimists. On the score of commitments for defense and defense support activities and statistical ability of people to buy other things, it is difficult to visualize a sharp, general nose-dive before the yearend. Nevertheless, there are many persons, including the writer, whose optimism is tempered by the remembrance of how quickly gigantic backlogs of orders can melt when capacity operations meet up with declining demand. —pp. 45-48, inc.

WE'RE OFF SCHEDULE: A year of Korean war has changed business trends less than one would think. Steel ingot operations are at 103 per cent of capacity compared with 101 per cent a year ago. Because of increased capacity, actual output is much higher. Electric power output is running about 12 per cent ahead of last year's levels.

On the minus side is construction volume. Measured in dollar value it is down 19 per cent from last year. Automobile output is down 22 per cent. Freight car loadings are about the same or a shade higher. The over-all significance of these comparisons is that civilian durables are being restricted while activities geared to defense are gaining ground. This transition is occurring at least six months later than the planners had anticipated. —p. 63

VERSATILE CONTROLS: In an excellent article on the advantages of production and inventory control, S. A. Peck, executive vice president of Trundle Engineering Co., shows how accepted control techniques can be applied successfully to widely varying types of manufacturing operations.

To demonstrate this versatility, he explains how production control has worked in three typical plants. The first is a manufacturer of household heating equipment. Its shipments vary quarter by quarter so that its production entails a seasonal stocking operation. A second illustration is an automotive manufacturer making internal combustion engines to order. This is a mass-production, nonstocking operation. The third example is a manufacturer of iron and steel castings, fabricated structural steel and custom-made materials handling equipment. This is a job-order shop which neither stocks a product nor has one of its own.

Production control has reduced costs in all three plants. The secret of success lies in varying the details of sound control principles to fit the peculiar problems of each plant.

—p. 74

GET OUT MORE SCRAP! As scrap drives gain momentum, it is becoming more and more evident that the work of co-operative scrap reclamation programs can be augmented by independent action.

Numerous companies in the ferrous and nonferrous industries already are devoting portions of their advertising to appeals to customers to turn in more scrap. Lake City Malleable Co. has purchased an old car ferry from which it will salvage 600 tons of steel for its foundries. Solar Steel Corp. has authorized its more than 70 salesmen to aid the National Scrap Salvage Drive by visiting Solar customers during July and August with plans to help them survey their plants for salvageable material. Personnel of an OPA field office has been successful in persuading a municipal street car line to speed the scrapping of unused rails and obsolete cars.

The opportunities for individual initiative and ingenuity in "getting out the scrap" are unlimited. —p. 57

SYNTHETIC GASOLINE: Persistence with which progress in extracting oil from shale gets into the news indicates that the day when fuel may be derived from this source commercially is not too far away.

Blaw-Knox Co. has been awarded a contract for construction of a demonstration-scale retort for producing shale oil. Meanwhile, the Bureau of Mines Coal-Hydrogenation Demonstration Plant in Missouri has completed a two-month run in which more than 50 carloads of coal were converted into synthetic oil. Yield was 3.7 barrels of oil for each ton of moisture-free coal processed. The oil will be converted into high-octane gasoline. The armed forces are running tests on synthetic gasolines produced in previous experimental runs.

It is reassuring to know that we may have large potential stand-by sources of synthetic oil in case our abundant supplies of natural petroleum are curtailed for any reason. —p. 57

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Today your DORMANT SCRAP* means more steel to help meet all-time high defense and domestic demands. Your country NEEDS it!

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HOW TO TURN SCRAP INTO MONEY...

with an organized dormant-scrap round-up in your plant:

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2. Organize a Salvage Committee and include a member from every department.
3. Survey and resurvey your plant for untapped sources of dormant scrap. Encourage your employees to look for miscellaneous scrap and report it to the committee.
4. Sell your entire organization on the need to scrap unusable material and equipment.
5. Prepare a complete inventory of idle material and equipment. Tag everything not in use.
6. Start it back to the steel mills by selling it to your regular scrap dealer.

7 KEEP AT IT!

* Your DORMANT SCRAP is any obsolete, broken or wornout and irreparable machinery, tools, equipment, dies, jigs or fixtures, etc., that may encumber your premises. These, in the language of steel, are *scrap*, vital to steel production, and hence convertible into cash.

Steel is normally made from scrap and new pig iron in about a 50-50 ratio. The use of scrap means *better* steel, *faster* . . . because scrap has already undergone one refining process. Today under pressure of domestic and defense demands, the steel industry is consuming purchased scrap at the rate of 100,000 tons per day . . . an all-time high. *Your* dormant iron and steel scrap is *urgently* needed.

Round-up and sale of your dormant scrap NOW will benefit you, all steel users, and our country by:

1. Keeping the steel furnaces producing at their highest rate in history.
2. Conserving our vital iron ore reserves. The *more* scrap used in steelmaking, the *less* ore needed.
3. Making *better* steel, *faster*.

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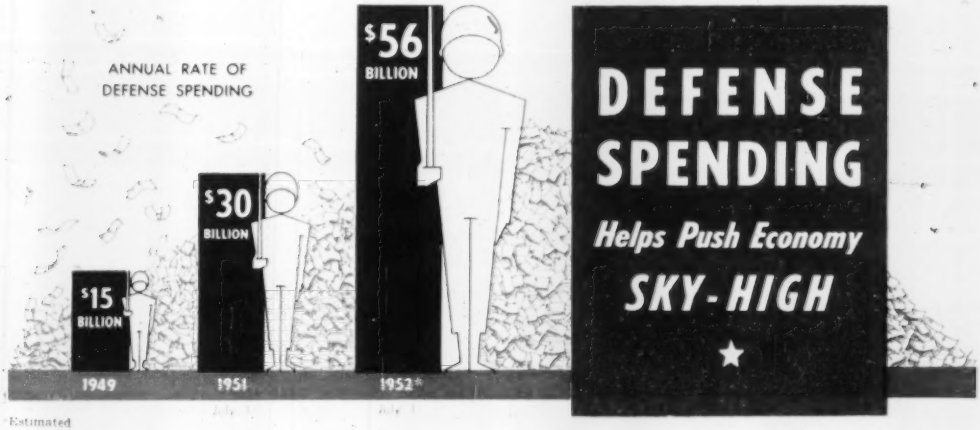


*Estimated

THREE FACTORS will continue to supply the economic lift to keep business flying sky-high in the second half of 1951, as it did in the first. Those conditions are: Defense spending, the boom in producers' goods sales and inflation.

In agreement with that statement are the overwhelming majority of metalworking executives, economists and bankers STEEL interviewed. In sharp disagreement with it are some of the market research people with companies making consumer durable goods, notably automobiles. They believe that the wing-clipping done by the government to their industries' output will nose-dive the entire economy.

Majority Rules—But the consensus is that defense spending, plus its psychological implications, will supply the fuel for sustained economic flight—at least for the next six months. As of now, nearly $600 million a week is being spent on rearmament (see the chart). A year from now the rate should rise to more than $1 billion weekly. That is the sum actually being paid out by the government for all defense activities. It does not include contractual obligations.

Military requirements bear more heavily upon metalworking than they do upon other sectors of the economy. In 1940, a peace year for the U. S., metalworking sales were less than 23 per cent of gross national product (GNP)—economists' term for the dollars you and everyone else in the U. S. get for goods and services. In the allout war year of 1943 the ratio bounded to 35.4 per cent, dropped to 28.5 per cent in 1950 and is now running at 32 per cent. Actual defense spending now is at the rate of about 10 per cent of GNP. A year from now it will be 20 per cent.

Bulwark—The major direct support for the present boom is the tremendous spurt in demand for producers' goods. Some of that spurt stems right from government spending, but most of it results from psychological snowballing. Monthly shipments of machine tools, for example, are running more than double year-ago levels. Order backlogs are so large that builders have enough business to last them 18 months at least. Peak demand for producer goods will occur in the next half, but needs will continue high for much of 1952.

Inflation is the third support, for the short term at least, of the current boom. Prices now are apparently stable (see the table) but slight price increases are likely in the next six months—perhaps 2 or 3 per cent by the end of the year above today's levels. Does that mean price controls are working? Somewhat, but the big reason why prices are leveling off is this: Panic buying, notably of consumers durable goods, is over now that we are becoming accustomed to the Korean situation. The steady rate of industrial activity in the last few months (see The Business Trend, pp. 63-65) also contributes to price stability.

CONSUMERS PRICE INDEX—ALL ITEMS

(1935-1939=100)

1951		Monthly Averages	
January 15	181.5	1939	99.4
February 15	183.8	1941	125.7
March 15	184.5	1948	171.9
April 15	184.6	1949	170.2
May 15	185.3	1950	171.9

Source: Bureau of Labor Statistics, Dept. of Labor

The Die Is Cast—Whether we have peace in Korea or not, we are now committed to a garrison state for years to come. It is possible, but not probable, that a Korean peace would bring popular pressure to scrap the rearmament. If that happens, or if we get into allout war, all predictions for the next six months are out. But a good bet is: Defense spending, the boom in producers goods and slight inflation will keep us riding high.

Metalworking sales will hit $102.4 billion in 1951 for an all-time high, compared with $82.2 billion in 1950 (see the cover). This table shows that sales in the first half of this year reached

METALWORKING SALES—FIRST HALVES

(In Millions of Dollars)

	1948	1949	1950	1951*
Iron, Steel and Products	$11.402	$11.630	$11.571	$16.350
Nonferrous Metals and Products	3.532	3.216	2.886	3.585
Electrical Machinery & Equipment	4.669	4.378	4.021	7.525
Machinery (Except Electrical)	7.542	7.318	7.414	11.350
Automobiles and Equipment	6.608	7.846	8.436	9.540
Trans. Equip. (Except Autos)	2.196	2.706	1.867	2.590
TOTAL—Metalworking Industry	$35.949	$37.294	$37.095	$50.940

* Estimated

$50.9 billion. GNP will average $320 billion for 1951 (see the chart), but the annual rate will soar to $325 billion by the fourth quarter. The fourth quarter is likely to be the period of greatest business activity in the second half. We're on a plateau now that promises to hold for the next three months.

A Word of Warning—The Federal Reserve Board's industrial production index will reach 230-235 by the

INDUSTRIAL PRODUCTION INDEX

(1935-1939 = 100)

1951	Monthly Averages		
January	221	1943	239
February	221	1946	170
March	222	1948	192
April	222*	1949	176
May	223*	1950	200

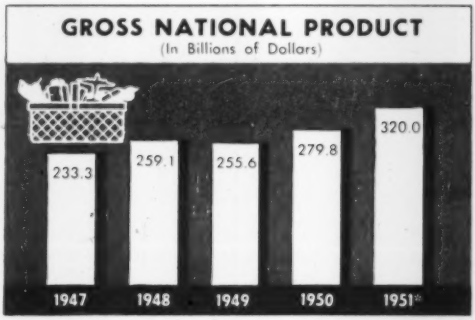
* Preliminary. Source: Federal Reserve Board

end of the year. In May, as the table indicates, it rose to 223, a new high for any month since June, 1945. The FRB index loses some of its significance in times of war because it is so weighted that industries involved in defense get a heavy play, while other industries that are hard hit by the rearmament program are not figured in the calculations.

Three major problems will continue to take the bulk of your time in the second half: Materials procurement, wages and labor supply. The Controlled Materials Plan will have little noticeable effect on easing procurement problems in the next three months, but it will begin to help in the fourth quarter. The next period is a transitional one for CMP and will probably be one of considerable confusion. For the time being, only that steel, copper and aluminum required for defense and defense-support programs will come under CMP in an open-end program. But the odds are that all available supplies of those metals will be controlled in a closed-end program by Oct. 1. Steel executives oppose that extreme step.

The Scene Shifts—CMP may solve many problems of those companies that can get under it, but the many firms that aren't under the umbrella will get just as wet as they have been getting in the past. Production cutbacks in civilian products have not been severe thus far, but they will be from now on. The percentage cutback will vary from product to product, but by the end of this year the average curtailment in strictly civilian activity will be 20 to 25 per cent, compared with average 1950 levels. That's not as bad as it sounds, because civilian production in 1950 has been exceeded only by the annual rate achieved in the first half of this year.

The third quarter promises to be an inventory shakeout period, especially in consumer goods. There



*Estimated

will be no inventory recession as occurred in 1949, but many businesses will take advantage of the breathing spell ahead to take stock of what they've bought in the past few months. Despite materials shortages, manufacturing inventories totaled $37.7 billion as of last April, for an alltime high. That's nearly 10 per cent above stocks at the end of 1950 when they were $34.1 billion. The catch is that those inflated inventories are badly unbalanced. The inventory outlook: Stocks will decline moderately over the rest of the year. Procurement may be an even more severe problem in the fourth quarter than it is now.

Rough Weather Ahead—Resign yourself to a rough time on wages in the next quarter. Wage Stabilization Board should have some sort of formula nailed down by the start of the fourth period, but until then you are in the middle. Union locals will push for everything they can wangle and will even strike occasionally to force WSB to act more rapidly. The board is mired down with 2000 cases before it still to be acted upon. It will eventually evolve a formula tied to the cost of living. If prices go up, wages will be permitted to rise correspondingly.

Manpower is the third most serious problem facing you in the months ahead. If yours is a small company, consider now what steps you can take to prevent the new big defense plants from hiring away your workers. Unemployment, at 1.6 million, is now at the lowest level since 1944 when the monthly average was 670,000 out of work. Today's labor force is 62.8 million but only 2.6 per cent of it are unemployed. That's even below the levels in the boom year of 1948 when 3.4 per cent of the 61.4 million labor force was out of work, on the average, each month. The labor market promises to become still tighter in coming months.

No Problem, Yet—The higher corporate taxes probably will have little effect on business activity for the short term. Corporations will be socked by a 5 percentage point boost in their income levies retroactive to Jan. 1, 1951. The overall ceiling on how much of corporate earnings can be taken in taxes will go up 8 percentage points to 70 per cent. The increase in personal income taxes will take off some of the inflationary pressures. A damper is needed there because, as the chart shows, personal incomes now are running

PERSONAL INCOME—ANNUAL RATES

(Billions of Dollars)

1951			
January	240.9	1939	72.6
February	241.3	1944	165.9
March	243.2	1949	206.1
April	245.2	1950	223.2

Source: Department of Commerce

at the rate of more than $240 billion a year, compared with $223.2 billion in 1950 and $206.1 billion in 1949.

Personal consumption expenditures—what you and everyone else spend for goods and services—have been at an annual rate of $205 billion in the last few months, compared with $191 billion in 1950. In coming months watch it drop below that $205 billion by $3 or $4 billion. By the end of the year it will rise again to about a $205 billion annual rate. Thus, personal consumption expenditures, normally a potent factor in the expansion of total business, will in the second half have little to do with the expected economic increases. The expansion of total business will come from two other sources: The stepup in defense spending and the very high volume of producer goods expenditure.

Reductions—Some of that difference between personal income and personal expenditures is being diverted to reduce the staggering $20.1 billion in consumer credit outstanding as of Dec. 31, 1950. In April, the credit figure was down to $19.1 billion after four consecutive months of decline. The declines, although slight, will continue for the rest of the year.

Metalworking generally will record sales of about $51.5 billion in the second half of 1951, but the performances of the individual industries won't be uniform. Here's how they will probably fare:

Iron and Steel—Steel production is steadily rising and will continue to do so for the remainder of 1951. Despite that increase, there's little chance of much easing in steel supplies before the end of the year. Barring strikes or other catastrophies, we'll produce 106 million tons of ingots and steel for castings this year (see the chart). About 53.5 million of that will be in the second half, 52.5 million in the first.

Annual capacity will be about 110.5 million tons by the end of the year, compared with about 104.5 million tons Jan. 1. Some steel company executives are predicting that supplies will be surprisingly close to demand sometime this year, but the consensus among steel consumers now is that the odds are against that condition resulting. With the exception of a brief period in 1949, we have been short of steel for the past decade. Officials in the National Production Authority in Washington contend we need 35 per cent more steel than is now being produced. That estimate is probably much too high. One development has occurred just in the past few weeks. The demand for steel is less frantic—but still high—at the warehouse level. The steel shortage is pretty much across the board for all finished products, but it is especially severe in bars, plates and shapes.

The steel supply picture will brighten after 1951. There's a good chance that supply will be close to demand about one year from now. The industry's expansion program will be bearing fruit in 1952 and 1953. We will have a capacity of at least 118 million tons of ingots in early 1953.

Steel prices will probably stay about the same for the rest of the year, unless the steelworkers win a major wage increase.

Automobiles—The automotive industry in the U. S. and Canada will produce 7.1 million cars and trucks in 1951 (see p. 48 chart). That figure is made possible by the phenomenal rate of assemblies in the first half. Because of the cutbacks ordered by the government, output will be far lower in the second half, but not exactly 35 per cent as determined by NPA. That's because the Big Three can shift some of their available steel to smaller models that use less of the metal.

Truck production will get greater emphasis from now on, particularly in the fourth quarter. About 1.2 million of them will be built this year, compared with 1.3 million in 1950 and 1.1 million in 1949.

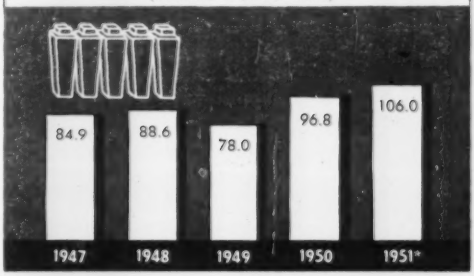
Signs are cropping up that Detroit could conceivably have trouble selling even the reduced number of cars it is permitted to produce. The chart shows that total assemblies will be below 1950 levels but still above everything else. Regulation W and excessive panic buying last year and early this year have dampened auto sales substantially. Used car prices are sagging. Auto makers conceivably might welcome an occasional "cutback because of material shortages."

One phase of the automotive business is still flourishing, though. That's repair parts. The volume promises to increase steadily as the age of autos on the road increases.

Household Appliances—Companies making those items are in about the worst shape of any manufacturer. Demand has fallen because of Regulation W and because of a natural decline caused by overbuying last year and this spring. In normal times, appliance activity is considered a good economic indicator. But now, production or lack of it means little to the overall business picture. Output of the major appliances has not yet fallen as much as supposed. Average monthly production of electric refrigerators in the first four months of 1951 was 487,000, com-

STEEL INGOT PRODUCTION

(In Millions of Net Tons)



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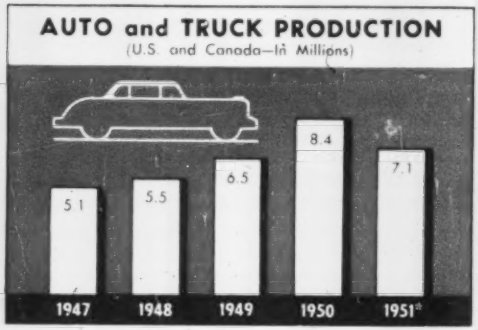


pared with 492,000 in the same period of 1950. Average 1951 monthly production of electric ranges and radios and television sets thus far has exceeded the average output for the same period of 1950.

Construction—Total construction put in place in 1951 promises to exceed the sensational $27.7 billion worth of building in 1950 despite the damper on residential housing. The table shows that new construction is now going up at a rate of more than $30 billion a year. In May new housing starts totaled 97,000, a 10 per cent jump over April. Total housing starts for the first five months this year are 444,500, only exceeded by the total in the same 1950 period. At least 800,000 new nonfarm housing starts for 1951 now appear certain despite Regulation X, the Federal Reserve Board's control on mortgage credit. Regulation X is having its effect though; new mortgage money by the end of the year will be taken out at the annual rate of about $8 billion or less, compared with $12 billion now.

NEW CONSTRUCTION

(Millions of Dollars)

1951	
January	2,501
February	2,572
March	2,672
April	2,628
May	2,484*

Monthly Averages	
1939	881
1942	1,173
1948	1,798
1949	1,883
1950	2,310

*Preliminary. Source: Depts. of Labor and Commerce

Construction is as high as it is because of the tremendous spurt in industrial and government building. The expenditure in federal, state and local government construction is now higher than at any other time in history, except 1942. Atomic energy and other defense plants, military facilities and highway work accounted for most of the increase.

During the first five months of 1951, new construction with a total value of $11,149 million was put in place, compared with $9.4 billion in the corresponding period of 1950, a 19 per cent increase. Total private outlays of $8085 million were 15 per cent above the corresponding period a year ago; public expenditures of $3064 million were up 30 per cent.

Producers' Goods—Closely related to heavy industrial construction outlays is the soaring demand for producers' goods. The table indicates that third quarter new plant and equipment expenditures will hit the annual rate of $25.6 billion. The average rate for the year will be at least $24 billion, compared with $18.6 billion in 1950 and $19.2 billion in 1948.

All producer goods items will be turned out to the limit of capacity for the rest of the year. CMP will be set up to allow makers of that equipment just about everything they need. Peak in demand will hold all through 1951 and into 1952, with a decline expected just about a year from now. We are in some danger of overexpanding in producers' equipment, a development that will become clearer a year from now.

NEW PLANT AND EQUIPMENT EXPENDITURES

(Millions of Dollars, Annual Rates)

1951*	
1st qtr.	20,640
2nd qtr.	25,680
3rd qtr.	25,600
1950	18,560

1948	19,230
1945	6,630
1941	8,190
1939	5,200

*Estimated. Source: Securities & Exchange Commission and Department of Commerce

Railroads—They hauled 605 billion ton-miles of intercity freight in 1950 and will do 5 to 10 per cent better in 1951, but earnings will still not be particularly sensational. They'll spend $1250 million in 1951 on capital improvements, 25 per cent more than the yearly average from 1946 through 1950. About one-third of the $1250 million will go for freight cars, the rest for locomotives, tracks and other fixed assets.

Shipbuilding—That line of activity is still a drop in the bucket, although anything could happen. There's more activity than last year, certainly, but nothing remotely approaches World War II production. Naval construction is picking up, but merchant activity is minor. A reserve fleet of World War II vessels still exists that could be activated in case of desperation.

Aircraft—The industry is still tooling up capacity, which helps producers of capital goods, but which has not yet made a big splash on other segments of metalworking. Remember that the industry is tooling for a capacity of 50,000 planes a year or more. That doesn't mean 50,000 will be built. A lot of the subcontracts in this industry are thus far on a sample lot basis. But aircraft will become increasingly important to metalworking and will have a greater impact in the fourth quarter than the third.

Ordnance—The same holds true for ordnance as for aircraft. Many ordnance plants to date have produced only a few complete units. In 1952, you'll see much higher ordnance and aircraft production performances.

Exports and Imports—The rising import and declining export trend will continue, particularly in steel products. Producers' equipment exports will hold up well.

The feeling in many metalworking companies now is: The sky's the limit on business expansion. The pessimists in industry are countering with this: The sky seems mighty low on a cloudy day.

Advertising Escapes Tax

Defense boss tells industrial ad men proposed tax on advertising is a dead duck

WORRIED about your advertising expenditures? Don't be. Speaking before 1200 members of the National Industrial Advertisers' Association at the Waldorf Astoria Hotel in New York last week, Charles E. Wilson, director of Defense Mobilization, said that the proposed tax on advertising is a "dead duck" for the present.

Opposed "I am definitely opposed to any such plans," he said. "Our hope in the defense mobilization program is that we can continue the flow of our civilian economy as normally as possible while engaging in our strenuous rearmament program. Advertising is a necessary lubricant for civilian economy. It keeps business flowing, prevents stagnation, introduces new products, develops new patents, promotes new business ideas. Taxing advertising would tend to reduce it; reduction of advertising would constrict business; constriction of business would result in fewer tax dollars."

Mr. Wilson's statement follows denial in Washington by assistant director of economic policy, Gardner Ackley, that CPR 22 and similar regulations issued by OPS will severely restrict manufacturers' expenditures for advertising.

Behind the Scenes In addressing NIAA members, Mr. Wilson also said: "Defense mobilization is making good progress, but this has not yet become fully evident because production is still largely in the tooling up stage. If we include orders on the books at the time of the Korean invasion, altogether $46 billion in contracts have now been signed.

"Serious bottlenecks are possible in machine tools and alloy metals. The former industry is far behind in its orders, due to circumstances beyond its control. We are trying very hard to see that it obtains the aid it must have to supply machine tools for ourselves and our allies. In the case of alloy metals, much of which must be imported, we are taking every measure possible to insure an adequate supply, but we are far from being out of the woods," Mr. Wilson said.

Manpower Shortages Certain aircraft companies are behind with their schedules for badly needed new models, because they cannot get a sufficient number of tool and die makers, machine tool designers and builders, aeronautical and electronics engineers. The blame here lies partly in the fact that some civilian manufacturers are still designing new models for which tools must be provided, and in so doing they are using skilled men who should be working in the defense program.

"The time has come when industry should scrap the idea of new seasonal designs in automobiles, dishwashing machines, vacuum cleaners or other nondefense items whose 1950 design is plenty good enough. Ingenuity of craftsmen in those activities could better be used in the defense mobilization program."

STEEL magazine was presented a certificate of merit in the *Industrial Marketing* annual editorial achievement competition for STEEL's series of articles on depreciation reform. This is the eighth editorial award in four years. In addition, STEEL is the winner of NIAA's premier award for the most effective publishers' sales presentation.

Machine Tool Sellers Sued

A civil antitrust suit charging seven companies and one individual with contracting, combining and conspiring to restrain interstate trade and commerce in the manufacture and sale of machine tools in violation of the Sherman Act was filed at Detroit by the U. S. Department of Justice.

Defendants are Associated Patents Inc., Carlton Machine Tool Co., and Lodge & Shipley Machine Tool Co., all of Cincinnati; Brown & Sharpe Mfg. Co., Providence, R. I.; Mac Investment Co., Cleveland; and DeVlieg Engineering Co., DeVlieg Machine Co., and Charles B. DeVlieg, of Ferndale, Mich.

Silent Sound

WORKERS at the Lockheed Aircraft Corp., Burbank, Calif. plant don't know it, but the plant's air-raid siren is blowing 24 hours a day. So is the factory whistle, but nobody hears it—except at designated quitting times, lunch periods and the like.

According to Arthur Paul Jr., electronics maintenance supervisor at Lockheed, the noise originates in tiny electronic tubes, called oscillators. Those tubes, kept continuously energized for instant service, produce electrical current—or streams of electrons. The current becomes noise, as in a radio, when it is fed into loudspeakers of Lockheed's factory-wide public address system. It takes three tubes for the mellifluous, three-toned factory whistle. One special tube makes the siren. Automatic controls turn on the whistle. The air raid warning can be sounded only by authorized personnel who have access to secret switches.

Machine Tool Price Order Set

The Office of Price Stabilization has announced Supplementary Regulation 2 of Ceiling Price Regulation 30, the curb on machinery prices.

The supplementary rule permits you to reflect in your ceiling prices for machine tools and machine tool attachments increases in your costs due to increased overtime or shift premium hours or increased subcontracting since the end of your base period. Increased costs for overtime and shift premiums are reflected in your ceiling prices by modifying the method of determining your labor cost adjustments set forth in CPR 30. Increased costs due to subcontracting are added to your ceiling prices determined under CPR 30.

Defense procurement agencies have requested maximum use of subcontracting and second and third shifts of labor, methods which greatly increase production costs. The object is to bring the industry this year to a $1 billion annual output rate as a firm mobilization base. In March the machine tool industry was producing at the rate of $432 million a year. Washington hopes the rate of production will be doubled by this order.

McLouth Plans Giant Expansion

McLouth Steel Corp. will spend $96.6 million on an expansion program at Trenton, Mich. Major project in the program will be construction of a blast furnace.

McLouth will say only that the construction is for facilities to produce pig iron, steel ingots and strip steel. Now, the company produces its ingots from four electric furnaces. Its estimated ingot capacity was 420,000 net tons annually, as of Jan 1, 1951.

The government is permitting McLouth to write off 70 per cent of the $96.6 million in five years for tax purposes. The certificate of necessity is good for six months.

Defense Production Administration in the week ended June 22, authorized 195 projects as eligible for tax concessions. Their estimated total cost nearly $628 million—brings to more than $7.3 billion the estimated costs of new facilities so far awarded the tax benefits.

Heating Industry May Get Help

Some provision will be made for metal allotments for the heating industry pending stabilization of the National Production Authority's Controlled Materials Plan, members of the Pacific Coast Gas Association were assured in San Francisco by H. Leigh Whitelaw of New York, managing director of the Gas Appliance Manufacturers Association.

Mr. Whitelaw, whose organization represents 604 gas appliance manufacturers, told a meeting in the West Coast city that the National Production Authority and the Defense Production Administration have recognized heating as essential to civilian needs as well as for military and defense programs.

Arms Job for American Radiator

American Radiator & Standard Sanitary Corp. is converting its Litchfield Park, Ill., plant to defense work under an Air Force contract to make sand molded magnesium castings for use primarily in fighters and bombers. President Thomas E. Mueller said the plant's normal production of radiator and warm air heating equipment will be transferred.

Subcontracts To Be Awarded

AC Spark Plug division of General Motors Corp. will subcontract a number of subassemblies for fire control systems it will build for the Army Ordnance Corps' "Skysweeper."

An electronically controlled instrument of the greatest precision and built to very close tolerances, the fire control system is used with the Skysweeper's antiaircraft guns. It automatically directs the gun by radar so that the projectile will meet the moving target and destroy it.

The complete fire control system will be assembled in Flint, Mich., at AC's Dort Highway plant.

Army To Help Small Business

The Army appointed more than 200 fulltime small business specialists at installations throughout the United States to aid small business firms interested in learning how they may participate in the current military procurement program.

They also will try to discover small firms capable of taking contracts or subcontracts.

Another function will be to assist in making inventory of the productive facilities of small business concerns.

IN WF BEAM BUSINESS: Kaiser Steel Co., Oakland, Calif., is now turning out wide flange beams, for the West's booming construction market. The wide flange members were rolled on Kaiser's structural mill, which only recently was adapted to this product. Kaiser structural shapes are rolled on a 29-inch cross country mill composed of a three-high rougher, a three-high intermediate stand and a two-high finishing mill

STEEL's Weekly Summary of Subcontract Opportunities

TWO MORE Armed Forces subcontracting exhibits are coming up in Cleveland and Los Angeles to help you land defense business.

The Midwestern affair will be held at the Cleveland Armory July 23-27 to enable Ohio, Kentucky and Michigan business men to learn what items of military production they can manufacture as suppliers for prime contractors.

On Display Prime contractors will show what parts they wish to farm out to sub or sub-subcontractors. Businessmen will be able to meet the engineering, production and contracting representatives of prime contractors and to discuss with them the actual products, machine tools and tolerances and to examine blue prints and specifications.

The same arrangements will be followed at the West Coast exhibit, to be held Sept. 18-21 in the main building of the Hollywood Turf Club, Inglewood, Calif. Both shows follow the plan which has been developed successively in Boston, New York, Chicago and Ft. Worth.

This week's awards of major contracts of interest to metalworking are:

PRODUCT	CONTRACTOR
Rings for Incendiary Bombs	Hemp & Co., Inc., Macomb, Ill.
Food Mixing Machines	G. S. Blakeslee & Co., Cicero, Ill.
	Triumph Mfg. Co., Cincinnati
Laundry Equipment	American Machine & Metals Inc., Ea.t Moline, Ill.
Fuzes	A-P Controls Corp., Milwaukee
	Gibbs Mfg. & Research Corp., Janesville, Wis.
	National Pressure Cooker Co., Eau Claire, Wis.
	Stewart-Warner Corp., Chicago
	United States Time Corp., Waterbury, Conn.
Ammunition Containers	Cans Inc., Chicago
Howitzer Tubes	Chain Belt Co., Milwaukee
Fire Controls	Merkle Metal Products Corp., Chicago
	E. W. Wylie Inc., & E. W. Wylie Co., St. Paul, Minn.
Cargo Trailers	Dunbar Kapple Inc., Geneva, Ill.
Tractors, wheel type	LeTourneau Inc., Peoria, Ill.
	M-R-S, Flora, Miss.
Tractors, crawler	International Harvester Co., Chicago, Ill.
	Caterpillar Tractor Co., Peoria, Ill.
Trailers	Lefstrand Co., Rockville, Md.
	Eidal Mfg. Co., Albuquerque, N. Mex.
Crane, shovel power unit	National Farm Machinery Corp., Inc., Shelbyville, Ind.
	Thew Shovel Co., Lorain, O.
Crane, revolving	Gar Wood Industries, Wayne, Mich.
Lockers	Bay City Shovels, Inc., Bay City, Mich.
Stands, machine gun	Andrew Wilson Co., Lawrence, Mass.
Trucks (stake, platform, dump	Diebold Inc., Canton, O.
Generator Sets	GMC Truck & Coach Division, Detroit
	Lycoming Spencer Div., Avco Mfg. Corp., Williamsport, Pa.
Air Conditioning Equipment	Enterprise Div., General Metals Corp., Oakland
Generator Assemblies	Carrier Corp., Syracuse, N. Y.
Inverters	Jack & Heintz Precision Industries Inc., Cleveland
Spotlight Assemblies	Jack & Heintz Precision Industries Inc., Cleveland
Recorders	Unity Mfg. Co., Chicago
Aircraft Generators	American Time Products Inc., New York
Machine Tools	United Mfg. Co., New Britain, Conn.
	Jones & Lamson Machine Co., Springfield, Vt.
Adapters	National Electric Welding Machines Co., Bay City, Mich.
	Empire Stove Co., Belleville, Ill.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

CONSUMER DURABLES—NPA Order M-47A, effective July 1, 1951, will control use of steel, copper and aluminum in most consumer durable goods in the third quarter of 1951. M-47, originally issued Mar. 7, 1951, expires June 30, 1951. Amendment 1 to M-47, which was the iron and steel control provided for the third quarter of 1951, is now superseded by the new M-47A for that quarter. M-7, aluminum, will be revoked. The copper order, M-12, will be amended to reflect transfer of some of its provisions to M-47A and of some other provisions affecting building materials to other orders.

On and after July 1, an end-product producer's maximum use of steel, copper and aluminum will be specified either by his Controlled Materials Plan allotment or, if he does not receive an allotment, by the classification of his product under M-47A, except for copper used in builder's materials, which will be handled separately. Producers who receive allotments for a CMP Class B product listed in M-47A are not thereafter subject to the coverage of the order for that product. Producers who receive allotments of CMP materials are limited by the amounts of those allotments and may not enter the free market for additional quantities of those materials, nor may they ignore the allotment and draw upon the free market for all such materials.

Products on List A in M-47A have consumption limitations of 70 per cent for steel, 60 per cent for copper, and 50 per cent for aluminum, figured on the January-June, 1950, base period. Products on List B in M-47A have consumption limitations of 85 per cent for steel, 80 per cent for copper, and 75 per cent for aluminum, figured on the first quarter, 1951, base period.

SEBACIC ACID—Schedule 7 to NPA Order M-45 puts sebacic acid under NPA allocation July 1, 1951.

METHYL CHLORIDE—Schedule 8 to NPA Order M-45 puts methyl chloride under NPA allocation July 1, 1951.

PRIORITIES FOR LABS—NPA Order M-71, issued June 26, 1951, and effective that date, gives priorities assistance to technical and scientific laboratories in procurement of materials needed for important research projects.

RUBBER—Amendment of July 1, 1951, of NPA Order M-2 restricts quarterly consumption of high tenacity rayon in production of rubber products for non-defense purposes to the average quarterly use during the first half of 1951. The amendment is effective July 1, 1951.

Controlled Materials Plan

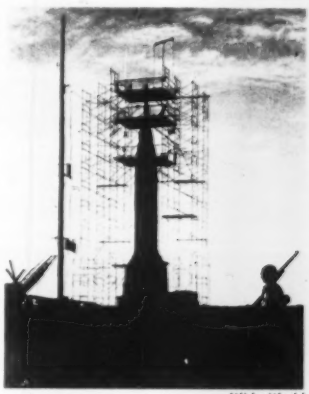
CONSTRUCTION—CMP Regulation 6, issued June 21, 1951, permits the construction industry to be under the Controlled Materials Plan. This regulation is largely permissive in character; owners and builders may elect to obtain construction materials under CMP procedures but are not required to do so.

CONVERSION OF ORDERS—Direction 1 to CMP Regulation 3 postpones from July 1 to July 7, 1951, the date on which authorized controlled materials orders will have preference over DO-rated orders calling for delivery of steel, copper and aluminum during September. Direction 1 was issued June 25, 1951.

ORDER LIMITATIONS—Direction 3 to CMP Regulation 1 stipulates that no prime consumer of controlled materials may order for delivery in any one month more than 35 per cent of the steel, copper or aluminum authorized in his quarterly allotment. This provision, however, does not require reduction of a delivery order below the minimum mill quantity specified in Schedule IV of CMP Regulation 1. Direction 3 was issued June 25, 1951.

NPA Regulations

FOREIGN MRO—Amendment of June 25, 1951, of Direction 2 to NPA Regulation 4 permits exporters of replacement parts and accessories for all types of machinery and equipment to continue using the DO-97 defense rating during July. This extension will continue in force only until a more permanent program is put into effect under the Controlled Materials Plan. Under this extension, exporters may use the rating in July to obtain up to 60 per cent of MRO export quotas certified to them by the Office of International Trade for the May-June period. This represents a 20 per cent increase over the May-June rate of use, and conforms to the increased use permitted to domestic firms.



Wide World

ON GUARD: A V-2 rocket stands readied for firing as a lone sentry walks his post at the joint long range proving ground, Cocoa, Fla. A lot of tubing is used in the scaffolding for these huge rockets

ORDERS CONVERTED—Direction 1 to NPA Regulation 2 automatically converts outstanding rated orders for non-controlled materials placed under programs of the Defense Department, Coast Guard and Atomic Energy Commission to orders bearing the new rating and allotment symbols required by CMP Regulation 1. Delivery orders affected are those placed under production programs of the three agencies and calling for delivery after June 30. The programs affected, together with their present and new identifying symbols, are listed in Schedule I of the direction. Conversion is automatic; neither the agency nor the supplier which placed the order, nor the supplier who will make delivery, is called upon to take any action. Direction 1 was issued June 25, 1951.

NPA Delegation

EXPORTS—Amendment of June 26, 1951, of NPA Delegation 12 delegates authority to the Office of International Trade to make allotments of controlled materials for export and to authorize exporters to apply allotment numbers to obtain export materials. Delegation 12 already had given OIT the authority to assign defense order (DO) ratings to exporters. The amendment simply extends the authority to include allotment of controlled materials.

Price Regulations

COPPER SCRAP—Ceiling Price Regulation 46 issued by the Office of Price Stabilization sets ceiling prices on copper scrap and copper alloy scrap. The regulation was effective June 26, 1951, and rolled back prices.

BRASS MILL SCRAP—Ceiling Price Regulation 47 issued by the Office of Price Stabilization sets ceiling prices on brass mill scrap. The regulation was effective June 26, 1951, and rolled back prices.

Munitions Board Names Group

Munitions Board of the Defense Department has established a Supply Management Advisory Council to improve business management and cooperative effort in military procurement.

The council will assist the Munitions Board vice chairman for supply management, W. J. McBrian, in developing basic policies, plans and programs to improve procurement and supply functions in the military departments. Mr. McBrian will be chairman of the council.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

FTC's acknowledgement of the steel industry's right to absorb freight may pave way for restoring freight absorption privilege to steel conduit and cement producers

HISTORICAL significance is seen by leading Washington attorneys in the Federal Trade Commission's steel order (STEEL of June 25, p. 47) acknowledging the right to absorb freight in order to promote competition.

While the steel order applies to steel only, the freight absorption provision expresses a principle which, if observed consistently by the commission, should apply to products generally. Some attorneys think that the way has been opened for similar liberalization of the Conduit order, and possibly the Cement order. The Conduit order went so far as to prohibit individual use of freight absorption. If steel can be sold at delivered prices characterized by freight absorption on the part of steel mills, these attorneys say, then the same privilege should be granted conduit manufacturers provided only that each manufacturer act individually and "innocently" and refrain from illegal discrimination.

Whether the commission will go so far as to revise orders that have been approved by the courts remains to be seen. In the meantime, commission attorneys insist that anyone reading into any of their orders a ban on freight absorption, if done individually and "innocently," is making an incorrect interpretation.

In the meantime, a Senate vote is due soon on S. 719, the McCarran bill which would settle the matter completely. This bill would give carte blanche to the quoting of delivered prices involving freight absorption.

New Head for NPA Division . . .

Marshall M. Smith has completed his six-month term as director of NPA's General Industrial Equipment Division, and Herbert L. Tigges, on leave from Baker Bros. Inc., Toledo, O., has succeeded him to serve as acting director for an indefinite period. Mr. Tigges had been acting as a part-time machine tool consultant in the division.

Mr. Smith has returned to his duties as vice president, E. W. Bliss Co., New York, and will devote his principal attention to managing the company's government relations, with Washington headquarters at 411 Fifth St. N. W., and to the affairs of the company's two foreign subsidiaries of which he is president.

A Break for Small Business . . .

Prompted by a critical report from the Senate Small Business Committee, the Department of Defense is overhauling its policy toward small business with the aim of placing a larger percentage of its procurement with small firms.

To speed efforts in this direction two small businessmen have been engaged as consultants. They are to recommend policy changes which will reverse the trend in which small business firms' dollarwise share in military procurement has dropped from 24 per cent in the first six months after the outbreak of war in Korea to 21 per cent.

MARSHALL M. SMITH
leaves NPA equipment division

HERBERT L. TIGGES
heads NPA equipment division

The two men are Harry E. Blythe, consultant on small business to the undersecretary of the Army, and Warren C. Bulette, consultant on small business to the chief of naval material.

Mr. Blythe, who has been small business consultant to the Munitions Board, and has been assisting the Senate Small Business Committee in its studies, is president and owner, STD Inc., Alliance, O., small manufacturer of stampings, tools and dies. Before that he had been vice president in charge of sales, Goodyear Tire & Rubber Co., and vice president and general manager Goodyear Aircraft Corp.

Mr. Bulette is a former president of Brandt-Warner Co., York, Pa., auto parts manufacturer, and took a prominent role in the organization of the famous York Plan of World War II by which equipment and labor resources of the York area were integrated to permit a maximum of war order subcontracting.

Research Center for Ordnance . .

A new approach has been adopted by Army Ordnance Corps to derive maximum benefits of current scientific research in developing improved ordnance equipment.

It has established at Duke University, Durham, N. C., a research center, manned by 15 civilian scientists and four Ordnance Corps officers, charged with evaluating the needs and problems of the Ordnance Corps and determining what specific basic research programs are needed to find solutions for these problems.

New Man in Foundry Section . . .

Francis E. Fisher, formerly sales manager, Hydro-Blast Corp., Chicago, has joined the Foundry Equipment and Supply Section, General Industrial Equipment Division, National Production Authority.

He will assist the present chief of the section, Aubrey J. Grindle, and eventually succeed Mr. Grindle as chief. Mr. Grindle plans to leave the NPA around July 31 to resume his duties as president of the Foundry Services and Equipment Corp. and Air Purification Corp., Markham, Ill.

Who buys Morgan Rolling Mills?

Morgan Mills-U.S.A.

REPUBLIC STEEL CORPORATION
1—24" Billet Mill
3—21" Billet Mills
2—18" Billet Mills
1—19" Billet and Sheet Bar Mill
4—18" Billet and Sheet Bar Mills
1—16" and 14" Merchant Mill
1—11" Merchant Mill
3—12" Merchant Mills
1—10" Merchant Mill
1— 8" Merchant Mill
4—10" Roughing Mills
1—10" Skelp Mill
1—38" Sheet Bar Mill
1—35" Blooming and Billet Mill
1—10" Wire Rod Mill
1—10" Merchant and Rod Mill
1—14" Strip Mill
1—32" Sheet Bar Mill
29 Mills

UNITED STATES STEEL CORPORATION

Carnegie Illinois Steel Corp.
1—24" Billet Mill
1—18" Billet Mill
1—16" Billet Mill
2—14" Billet Mills
1—10" Hoop and Cotton Tie Mill
1—13" Merchant Mill
1—11" Merchant Mill
1—10" Merchant Mill
1—18" Sheet Bar Mill
1—10" Rod, Tie, and Spike Rod Mill
1—12" Roughing Mill
1—10" Merchant and Strip Mill

American Steel and Wire Company
1—18" Billet Mill
1—13" Billet Mill
1—10" Strip Mill
3—10" Rod Mills
1— 9" Wire Rod Mill

Columbia Steel Co.
1—10" Rod Mill

Tennessee Coal, Iron & R. R. Co.
1—21" Billet and Sheet Bar Mill

United States Steel Co.
1—10" Continuous Bar Mill
23 Mills

BETHLEHEM STEEL COMPANY
1—30" Billet Mill
1—24" Billet Mill
1—18" Billet Mill
3—18" Billet and Sheet Bar Mills
2—12" Merchant Mills
3—10" Merchant Mills
1— 8" Merchant Mill
1—12" Skelp Mill
2—10" Wire Rod Mills
2—10" Wire Rod and Merchant Mills
1—10" Wire Rod Finishing Mill
18 Mills

JONES & LAUGHLIN STEEL CORP.
1—20" and 16" Billet Mill
1—21" Billet Mill
1—18" Billet Mill
1—21" and 18" Sheet Bar Mill
1—14" Merchant Mill
1—13" Merchant Mill
1—12" Merchant Mill
1—11" Merchant Mill
1—10" Merchant Mill
1—10" Skelp Mill
2—10" Wire Rod Mills
12 Mills

YOUNGSTOWN SHEET & TUBE CO.
1—24"-18" Billet and Slab Mill
1—24"-18" Billet Mill
1—14" and 18" Merchant Mill
1—12" Merchant Mill
1— 9" Merchant Mill
1—18" Sheet Bar Mill
1—21" Sheet Bar and Skelp Mill
2—10" Skelp Mills
1—10" Wire Rod Mill
1—10" Merchant and Rod Mill
1—21" Billet and Slab Mill
12 Mills

SHEFFIELD STEEL CORPORATION
1—19" Sheet Bar Mill
1—12" Roughing Mill
1—18" Billet Mill
2—10" Rod and Merchant Mills
2—12" Merchant Mills
7 Mills

FORD MOTOR COMPANY
1—39" Billet Mill
1—18" Billet and Sheet Bar Mill
1—42" Blooming Mill
1—14" Merchant Mill
1—10" Merchant, Rod and Strip Mill
1—12" Spring Mill
6 Mills

INLAND STEEL COMPANY
1—19" Billet and Sheet Bar Mill
1—24" Billet and Slab Mill
1—11" and 8" Merchant Mill
1—14" Merchant Mill
4 Mills

SHARON STEEL CORPORATION
2—13" Roughing Mills
1—21" Sheet Bar and Slab Mill
1—18" Strip Mill
4 Mills

COLORADO FUEL & IRON CORP.

Colorado Fuel & Iron Corp.
1—10" Rod Mill
1—12" Merchant and Skelp Mill

Wickwire Spencer Steel Co.
1—18" Billet Mill
1—10" Rod Mill
4 Mills

LACLEDE STEEL COMPANY
1—12" Roughing Mill
1—10" Rod Finishing Mill
1—10" Rod Mill
3 Mills

PORTSMOUTH STEEL COMPANY
1—18" Billet and Sheet Bar Mill
1—10" Wire Rod Mill
2 Mills

ATLANTIC STEEL COMPANY
1—14" Billet Mill
1— 8" Bar, Hoop, Tie and Rod Mill
2 Mills

PITTSBURGH STEEL COMPANY
1—18" Billet Mill
1—10" Wire Rod Mill
2 Mills

JOHN A. ROEBLING'S SONS CO.
1—18" Billet Mill
1—10" Wire Rod Mill
2 Mills

WEIRTON STEEL COMPANY
1—21" Billet Mill
1—18" Billet and Sheet Bar Mill
2 Mills

WISCONSIN STEEL COMPANY
(Sub. of International Harvester Co.)
1—11" and 8" Merchant Mill
1—16" and 14" Merchant Mill
2 Mills

ACME STEEL COMPANY
1—10" Hoop and Strip Mill

ALUMINUM COMPANY OF AMERICA
1—10" Merchant and Rod Mill

KEYSTONE STEEL & WIRE COMPANY
1—10" Rod Mill

OLIVER IRON & STEEL CORP.
1—11" Merchant Mill

PITTSBURGH CRUCIBLE STEEL CO.
1—12" and 8" Merchant Mill

WICKWIRE BROS.
1—10" Rod Mill

NATIONAL TUBE CO.
1—19" Skelp Mill

In addition, customers in other countries have purchased 66 Morgan Mills

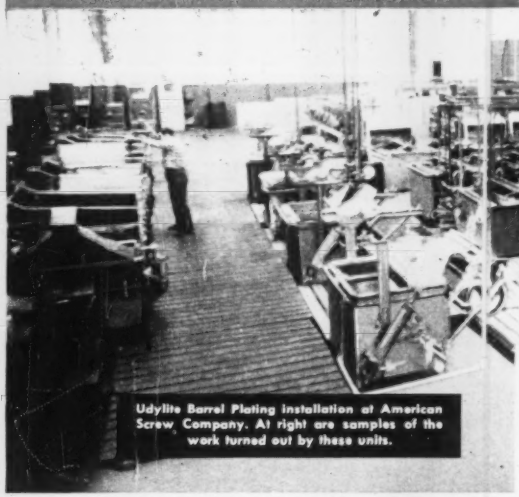
MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS

English Representative: International Construction Company
56 Kingsway, London, W.C. 2, England

MORGAN
WORCESTER

ROLLING MILLS · MORGOIL BEARINGS
WIRE MILLS · GAS PRODUCERS · AIR EJECTORS
REGENERATIVE FURNACE CONTROL

NO DOWN TIME IN WEEKS OF 'ROUND-THE-CLOCK OPERATION with **UDYLITE BARREL PLATERS,** reports American Screw Company



Udylite Barrel Plating installation at American Screw Company. At right are samples of the work turned out by these units.

Here's a record hard to equal! American Screw Company, Willimantic, Conn., has a battery of Udylite Barrel Platers for zinc, nickel, cadmium and brass plating of screws. The equipment normally operates 16 hours a day but during peak periods is in constant use around-the-clock for weeks at a time with practically no time out for maintenance or repair.

In addition—according to Walton R. Yerger, Metallurgical Engineer—plating results are highest quality, with uniform thickness and luster from lot to lot and day to day. Rejects are virtually non-existent and plating costs have been substantially reduced.

Udylite Barrel Platers have no equal in ability to stand up under the punishment of continuous production and still turn out well-plated work in a minimum of time. Service records show that a Udylite unit lasts longer and produces more work with less maintenance.

Bring the benefits of Udylite equipment's efficiency and durability to your operations. Call in your Udylite Technical Man today and have him show you the Udylite Way to Better Plating. Or write direct to The Udylite Corporation, Detroit 11, Mich., for complete details. There's no obligation.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING

Canadian Firm Formed

Steel Improvement & Forge establishes subsidiary to make jet blades for the dominion

STEEL Improvement & Forge Co., Cleveland has organized a wholly owned subsidiary, Canadian Steel Improvement Ltd. A 41,000-square-foot plant will be built in Etobicoke township near Toronto, Ont., to forge aluminum compressor blades and nickel alloy turbine blades for jet aircraft engines manufactured by A. V. Roe Canada Ltd. for the dominion government.

Officials of Steel Improvement & Forge have been considering Canada for some time as a logical field for expansion because of their specialization in production of precision forgings of high heat resistant qualities, a line of work not being done there. The company has a $10 million backlog of orders and up to now has been supplying jet engine blades from its Cleveland plant.

Monel Forgings for Oil Fields SIF was established in 1913 as a commercial heat treating plant, took on forging two years later and after the depression following the first World War experienced a rebirth of prosperity by developing techniques for the forging of Monel metal for the oil industry, under direction of the late Charles H. Smith Sr.

In World War II the company worked closely with aircraft and armament plants on forging of stainless steels for turbosuperchargers. Among principal customers was the Bristol Aeroplane Co. Ltd. of Britain, whose engineering representative in the U. S. was Aubrey H. Milnes. He became chief engineer for SIF in 1947 and is now vice president in charge of engineering. The company president, treasurer and general manager is Charles H. Smith Jr., who succeeded his father at the time of the latter's death in 1942.

Just arrived from Britain is Cyril J. Luby who has been experimental works manager for Bristol Aeroplane's engine plant at Bristol, England, to assume general management of the new Canadian forging division, tentatively scheduled for production late this year.

The Cleveland division keeps a force of 800 busy on a variety of forging work for aircraft, ordnance and navy contractors. About 95 per cent of current orders are in this category, and 75 per cent of them are for high-alloy material. The average order is of job-lot size, and in a weight range up to 500 pounds. Hammers are both steam and board drop types, 33 in all, steam units ranging from 2000-14,000 pounds, and board hammers between 1000 and 3000 pounds.

Canadian Construction Curtailed

In Canada the major concern is not so much the raw materials, but the finished steel itself. Steel controls, first introduced in February, may be tightened soon.

C. D. Howe, Canada's defense production minister, warns Canadians not to start new construction projects requiring steel. He says he is "very worried" about the steel situation in the country.

His department is preparing a new order to cut further the use of steel for nonessential purposes. It will hit especially hard plant construction for manufacture of many consumer goods.

U.K. Wants U.S. Machine Tools

The United Kingdom has placed $112 million worth of machine tool orders in the U. S. and wants to place more. The $112 million was the sum allotted it for that purpose from Mutual Defense Assistance Program funds.

Rust To Modify African Furnace

Rust Furnace Co., a subsidiary of Rust Engineering Co., Pittsburgh, is working on design and engineering changes to increase capacity of a slab heating furnace for South African Iron & Steel Industrial Corp. Ltd. at Pretoria, South Africa.

Rebuilding will increase the capacity of the furnace to 100 tons per hour. Rust first built it in 1941. It serves a plate mill of the corporation's Iscor Works, together with another Rust slab heating furnace constructed in 1947.

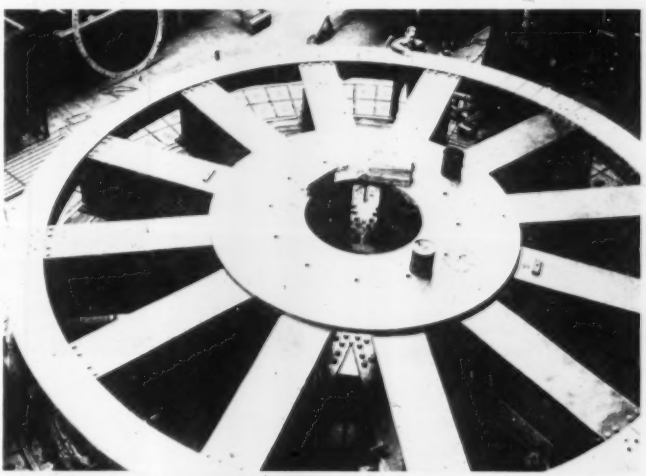
Wean Gets U.S. Steel Job

Wean Engineering Co. Inc., Warren, O., will build a continuous strip pickling line, a continuous strip cleaning line, a continuous electrolytic tinning line and a combination temper mill and shear line for U. S. Steel Co.'s new Fairless Works near Morrisville, Pa.

The pickling line, which Wean says will have the largest capacity of any similar unit in the world, will remove oxide formed during hot rolling. The strip cleaning line will handle cold reduced strip at speeds up to 2000 feet per minute. The tinning line is designed to handle coils weighing 30,000 pounds and containing five or six miles of steel strip in each coil. The combination temper mill and shear line will receive coils from the hot strip mill for temper rolling under tension, side trimming and cutting to length for shipment.

West Virginia Steel Gets Loan

West Virginia Steel & Mfg. Co., Huntington, W. Va., has been granted a $3,750,000 loan by Reconstruction



SHAPING A SPIDER: A wheel of power is this rotor spider for a 27,000-kva hydro generator being built by General Electric's large motor and generator divisions at Schenectady, N. Y. The 29-foot diameter rotor is mounted on a boring mill where the brake plate has just been machined

Finance Corp. Of that sum, $2,215,000 will be for machinery and equipment for a steel plant.

J&L Hopes To Speed Expansion

Jones & Laughlin Steel Corp. expects to be pouring steel from some of its new furnaces late this year, even though progress on its construction program has not been entirely satisfactory.

J & L will spend about $200 million this year and next on expansions. In the previous five years, the company had spent $190 million. Current construction progress has been hindered by the increasing difficulties in obtaining material and equipment and by weather conditions. President Ben Moreell says that at least part of the lost time can be recovered in the coming months.

Main project is the 11-furnace open-hearth shop at the Pittsburgh works that will have an annual capacity of 1,980,000 tons. The company expects to make steel in the first six furnaces this year. The remainder will go into production during the first half of 1952. Capacity is also being increased at the Otis works in Cleveland. By 1952, J & L's potential for making steel will be 6.4 million tons, or 32 per cent greater than today's capacity of 4,850,000 tons.

Barium Plans Construction

Barium Steel Corp., New York, which now ranks among the first 15 of the country's steel producers, plans further expansion and modernization of its facilities in eastern Pennsylvania.

Barium bought the Central Iron & Steel Co. of Harrisburg in 1946, and has been making improvements including addition of three cupolas to provide hot metal for its open-hearth furnaces; a slabbing mill; steam generating equipment; two new continuous slab heating furnaces for its 89-inch plate mill; a new roll grinder; and a new 1000-ton press for making tanks and other equipment for its fabricating department.

The Phoenix Iron & Steel Corp. plant at Phoenixville, Pa., acquired in 1949, has been rehabilitated and now is producing structural shapes, channels, beams and angles. A 600-ton blast furnace at Chester, Pa., also acquired in 1949, was blown in June 6 and is supplying pig iron to the steel plant. Iron ore is coming from Puerto Rico, the Oliver Iron Mining Co.'s properties in the upper lakes and other sources.

Griff Davis from Black Star

LUMP ORE FOR U.S. OPEN HEARTHS
. . . it awaits shipment from West Africa

Expansion plans contemplate a mill for producing line pipe at Harrisburg. A 3-high mill for rolling pipe skelp and purchased from Tennessee Coal, Iron & Railroad Co. will be powered by engines from the aircraft carrier *Attu* and is yet to be installed. Other improvements and additions include open-hearth furnaces, conveyors, etc.

Lukens Stops Mill for Overhaul

Lukens Steel Co., Coatesville, Pa., is closing down its 140-inch plate mill for about ten days for necessary overhauling.

The company is constructing an additional 2-million-gallon fuel oil storage tank and is relocating a second tank of similar capacity. Lukens uses natural gas principally, but is installing the oil tanks for standby reserves.

Sharon Steel Gets Diesels

Sharon Steel Corp. has received the first of 18 diesel-powered yard locomotives that will modernize transportation in the firm's Roemer Works, Farrell, Pa., and Lowellville Works, Lowellville, O. The first yard-switcher, a 1200-hp locomotive, will go into service in the Lowellville Works.

The dieselization program includes eight locomotives of 800 hp, two of 1200 hp and eight smaller units for use within the shops and mold yards. Program is to be completed by the end of next year and will cost Sharon $1,784,100. Fuel oil storage tanks are being installed at both Roemer and Lowellville Works to supply the new equipment. Baldwin Locomotive Works and American Locomotive Co. are manufacturing the engines for Sharon.

African Ore Arrives

Republic Steel gets first shipment of high grade iron ore from Liberia

REPUBLIC Steel Corp. has started charging its open hearths in Cleveland, Warren, Youngstown, Canton and Massillon, O., with the first iron ore received from Liberia in West Africa.

The first shipment of 10,000 tons came more than 4300 miles and is the initial delivery to the U. S. from the Bomi Hills deposit 43 miles inland from Monrovia, the capital of Liberia. The mine will eventually produce about 2 million tons of ore yearly, which assays up to 70 per cent iron, compared with 50.4 per cent for Mesabi ores.

Majority Owner—The material will be mined by Liberia Mining Co. Ltd., which has an 80-year concession on many square miles of ore-bearing territory in Liberia and which is 57 per cent owned by Republic. Republic will use part of the ore for its own furnaces and will sell the rest. There are 25 to 30 million tons of proven open-hearth ore in the Bomi Hills area. Much more of that and lower grades exist, but fixed estimates of the reserves cannot be made until the results are known of a diamond drilling program that will start next year.

The ore deposit is in the form of a cliff almost a mile long and from 30 to 100 feet high. Over the years, the face of the cliff has broken off, leaving a huge continuous pile of ore at its foot in pieces ranging from a marble to a box car in size. They need be only cleaned, sorted and loaded. The ore is hauled to Monrovia via a new narrow-gage railroad. An ore loading dock at Monrovia is now under construction.

Private Vessels—For the time being, the raw material will be shipped by chartered vessels. Early in 1952, the first of a fleet of 23,000-ton ore carriers, built for Liberian Navigation Co., of which Republic is half owner, will take over.

On the U. S. side of the Atlantic, the ore will be unloaded at Baltimore & Ohio Railroad's new $5 million ore dock in Baltimore. The first cargo arrived there aboard the *SS Simeon G. Reed*.

Bethlehem Plans Ore Mine

Bethlehem Steel Co. plans to sink a 3000-foot shaft to mine iron ore on the 5000-acre site it purchased near Reading, Pa. Construction will start this summer.

Bethlehem has received a govern-

ment priority to build a $34 million steel processing plant near the proposed shaft.

Blaw-Knox To Build Shale Plant

Chemical Plants Division of Blaw-Knox Co. has been awarded a $333,870 contract by the Bureau of Mines for the design and construction of a demonstration-scale retort for the continuous extraction of oil from shale.

To be located at Rifle, Colo., the plant will process from 150 and 400 tons of oil shale daily. It will employ a new "gas-combustion" retorting process developed by the bureau.

Oil-from-Coal Plant Runs Tests

The Bureau of Mines' Coal-Hydrogenation Demonstration Plant at Louisiana, Mo., just completed a two-month experimental run in which more than 50 railroad-car loads of coal were converted to synthetic oil.

Some 2600 tons of coal yielded nearly 8000 barrels of synthetic oil, or 3.7 barrels of oil for each ton of moisture-free coal processed. The oil produced in the plant will be converted to high-octane gasoline in vapor-phase operations. Thousands of gallons of such synthetic gasoline produced by the Missouri plant in five previous trial runs have been undergoing tests by the armed forces.

Bureau officials say that the latest experimental run at the demonstration plant marks a further step in proving the engineering feasibility of operating American-built plants of that nature.

I. T. & T—A. T. & T. Pool Patents

International Telephone & Telegraph Corp. and American Telephone & Telegraph Co. will begin pooling their patents in the interest of the defense program. Under the agreement, the two communications systems have licensed each other to use inventions made before Dec. 31, 1956.

The world cross-licensing agreement covers substantially the entire field of tele-communications.

T. S. Fuller Heads ASTM

New president of the American Society for Testing Materials is Truman S. Fuller, engineer in charge, works laboratory, General Electric Co. He is a former member of ASTM's board of directors, serving in 1937-1941 and again 1947-1950, was elected vice president last year and now succeeds L. J. Markwardt to the presidency.

Elected vice president for a two-year term is Dr. Leslie C. Beard Jr., assistant director of laboratories, Socony-Vacuum Oil Co. The society ended its four-day annual meeting June 22 at Chalfonte-Haddon Hall, Atlantic City, N. J.

The following are new members of the board of directors: John W. Bolton, Lukenheimer Co., Cincinnati; Rudolph A. Schatzel, Rome Cable Corp., Rome, N. Y.; E. O. Slater, Smith-Emery Co., Los Angeles; Stanton Miller, National Sand and Gravel Association, Washington; and F. P. Zimmereli, Barnes-Raymond-Gibson Division of Associated Spring Corp., Detroit.

Atomic Lab Details Studied

Sign of the times is the selection of "Design and Construction of Atomic Installations" as the subject of the Washington conference to be held in October by the Building Research Advisory Board, National Research Council.

Design of "hot" laboratories such as are now being constructed for industrial research, the selection of building materials and surface finishes, the means of shielding against radioactivity, and the disposition of radioactive wastes will be among the conference topics.

Scrap Drives Gain Speed as Companies Pitch In

THE DRIVES to get more ferrous and nonferrous scrap are picking up momentum. Individual companies are going to unusual lengths to get the vital material.

Lake City Malleable Co., Cleveland, will use the scrap from an old car ferry, the *LaSalle* (see the photo), in castings for government orders. Some 600 tons of steel will be salvaged from the vessel which once carted automobiles on a Detroit-Windsor, Ont., run.

Solar Steel Corp., Cleveland, will have its sales force of more than 70 warehouse salesmen spend most of their time during July and August aiding in the National Scrap Salvage Drive. They will call on the management of all Solar customers with plans to survey each plant for salvageable scrap that can be moved into legitimate scrap channels at once. They also will present a program for organization of a continuous monthly follow-up on scrap salvage.

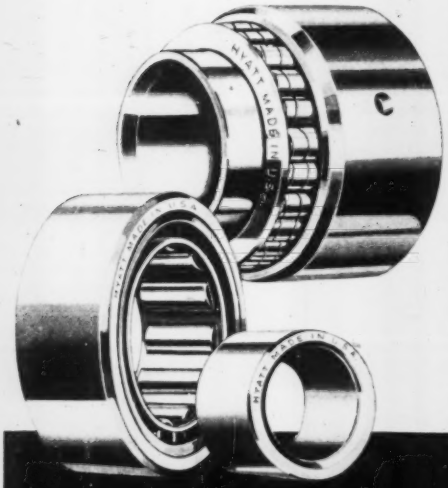
Bridgeport Brass Co., Bridgeport, Conn., is one of many ferrous and nonferrous companies that are devoting part of their advertising campaign to pleas for scrap. Bridgeport makes these suggestions to all brass consumers: Store all scrap in clean containers, keeping it separated by alloy and properly identified; when enough has been collected, notify the brass mill for whom it is intended; give details as to weight, alloy, character of scrap; ask the brass mill to collect it or to designate the particular scrap dealer who does that work for the brass mill; if you know where there are clippings of zinc resulting from manufacturers' cups or stampings, or scrap copper wire or other forms of good clean scrap of brass, bronze or copper not generated by brass goods manufacturers, notify your supplier of brass mill products.

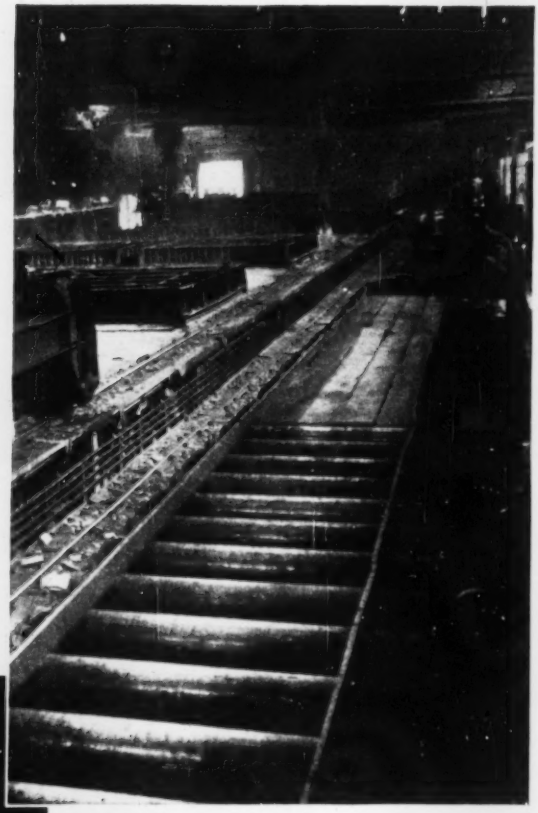
Cleveland News Photo

CAR-FERRY LASALLE: VICTIM OF THE SCRAP DRIVE
. . . Lake City Malleable will salvage 600 tons of steel from it

Congratulating–

ALAN WOOD STEEL COMPANY





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Long associations are the rule, rather than the exception, with Hyatt Roller Bearings. Designed for rugged steel mill service and backed by performance records and application engineering experience second to none, Hyatts have established themselves as the preferred steel mill bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.; Chicago; Pittsburgh; and Oakland, Calif.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Mutiny in the ranks of the United Autoworkers threatens as Carl Stellato, head of the large Local 600 at Ford's Rouge plant, bids for power

DETROIT

FOR THE moment at least the name "Solidarity House" applies only to the new building in which the United Autoworkers will be headquartered. The solidarity of the union itself has been badly cracked, if not broken wide open.

Walter Reuther, UAW-CIO president, has had rebellion on his hands before and has been able to put it down successfully. But the revolt now centering in Local 600—largest of union locals—has behind it a numerically potent force. This outsize group from Ford's sprawling River Rouge plant, furthermore, has been bolstered by a contingent of General Motors' locals, and has some Chrysler union support.

Do or Die—Carl Stellato, Local 600 president, and a one-time Reuther champion, will either be made or broken by the intramural fracas. Stellato got at outs with Reuther when he led in the unsuccessful opposition to an increase in union dues at the Cleveland convention in April. Since that time the rift has deepened. Reuther's strength won a test with Stellato at the end of May, but seemed to suffer in the latest encounter. No knockouts have yet been scored and more rounds are certain to be coming up before the contest is over.

Reluctant Follower—As May closed Stellato's local was set to strike the Rouge to compel the company to pay the 4-cent improvement factor if wage stabilization board did not approve it. Reuther at that time directed Local 600 to sit tight. If any strike action was to be taken to force this issue all locals with this contract provison would do it together. Stellato reluctantly abandoned his plan.

Then came Local 600's arrangements for the tenth anniversary celebration of Ford's union-shop contract. This should have justified a bang-up rally for the UAW, and would have attracted top politicos from the labor-minded state and local governments. Stellato pulled his coup by booking John L. Lewis to do the affair's main speechmaking.

Challenge Accepted—Reuther rose to the bait. He had to. He has previously accused Lewis and his UMW catchall District 50 of planning to absorb autoworkers' locals. He and Lewis are the bitterest of enemies. So from the international executive board of UAW came a unanimous decision. Union officers and board members were to decline invitations to participate in the celebration. The executive board charged that elements in Local 600 were using the occasion "for a continuation of devious political manipulations." And Lewis was allowing himself to be used "as an instrument for those . . . manipulations."

John Lewis revelled in the hullabaloo. Speaking to a crowd which overflowed Local 600's headquarters and an adjacent field, he teed off on Reuther with a good many of the vituperative syllables in his elephantine vocabulary: "It appears that the best way to have a successful celebration is to have some pseudo-intellectual nitwit put a boycott on it . . ."

Contract Scorned—He denied he had any desire to put the autoworkers under his wing. He scorned the autoworkers' escalator-type contracts. If such a contract had been accepted by mineworkers," he said, "their wages would now be one-third of what they have become through regular collective bargaining."

He called for the collection of a $50 million "labor defense" fund, $40 million to come from 40 AFL and CIO unions and $10 million from his UMW. With this kitty, he declared, "young Hank Ford, Charley Wilson and Alfred Sloan would not dare to seriously attack any union."

A Note of Warning—Then he made a disquieting suggestion, one which probably will come into the minds of UAW members frequently. He warned that when the present defense program finishes, purchasing power will be insufficient to maintain full employment. "Unless labor makes itself strong and wins shorter hours, more wages, more benefits and more everything, a depression will follow," he asserted.

With a strong pro-communist minority in Stellato's union (enough to force a runoff election this spring) there is good cause around Detroit generally and the Ford plant specifically to be fearful of the consequences if unemployment or recession of any magnitude appear in prospect.

Public Relations—The UAW has begun a half-hour a week televison show to put across to its members and the public the union's objectives, where its money goes, etc. Not yet developed to the point where it will lure watchers from wrestling, and at present no match for the excellent educational fare being served up on this medium by the National Association of Manufacturers, the program holds the opportunity to tell the union's story more effectively than has been done before.

The UAW, furthermore, is beginning to do some construction work with planks taken from its Cleveland convention platform. Formation of a nonprofit insurance company is envisioned, and company-paid cradle-to-grave security is desired. Until that's achieved, the union has established a "co-op burial service" plan for Detroit area members. Funerals are to be conducted by a licensed undertaking parlor, with the services and charges supervised by the union. The co-operative arrangement, the union feels, will result in savings approximating 50 per cent.

Trouble in Adrian—Labor troubles continue to flare in UAW-organized plants. The pilot plant at Adrian, Mich., where manufacturing methods for the Air Force are developed was closed last week as the workers re-

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	680,257	585,705
May	681,643*	732,161
June	659,000*	897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Week Ended	1951	1950
June 9	152,656	200,515
June 16	157,026	204,704
June 23	159,443	205,334
June 30	160,000*	197,767

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

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belled against management by Reynolds Metals Co. Formerly operated by Gerity-Michigan, the plant went under Reynolds management Mar. 15, and since then, according to the UAW, wages have been slashed as much as 65 cents an hour and all fringe benefits cancelled.

Hudson's daily routine of starting production and then closing down as soon as unfinished cars begin coming off the "final" assembly carried over into last week, and the union local voted three to one to strike to force the company's management to bargain over the cutbacks made in the number of men required for certain assembly operations.

Turning Point in Auto Output

The new month and new quarter definitely mark the turning point in automotive production. There is reason to believe that unemployment this quarter will be a serious factor to reckon with in this area. All auto producers will be affected to some extent by NPA M-68 and more importantly, it is felt, by spot shortages of materials, chiefly alloy steel. While the picture with respect to the immediate future is cloudy, what will happen come November-December is even more uncertain. Some model changes that only a month ago appeared certainties are now unsettled, and some body tooling has been cannibalized by the defense program.

The same is true of some new engine machine tools, which are fast being scattered by the requirements of the military. If the electrical motor situation tightens further some tool builders are convinced they will have to take still more away from the auto industry. This adds up to one thing: Any speculation as to the magnitude of body and engine changes in 1952 models, regardless of the integrity and present knowledge of the original informant, is subject to change overnight.

V-8 in Chrysler Saratoga?

It is reported that Chrysler will reintroduce its Saratoga model in August and will feature in it the new firepower V-8 which is currently available only in the Crown Imperial, Imperial, and New Yorker models.

Production of that engine has been somewhat hamstrung by the materials situation, and whereas as late as the end of April output was scheduled to climb from 100 engines an eight hour day in May, to 500 a day in June and 600 in July and to hold at that figure, the corporation has had to recalculate and is just now trying to get output above the 400-daily level. It seeks a 450-a day rate this month, which it will try to maintain through the rest of the year.

Stethoscope Service for Packard

A story has been circulated of some high-priced foreign cars having their engines checked by a factory technician with a stethoscope to make sure functioning is perfect.

That medical diagnostic approach to mechanical ailments is now being instituted in the Packard organization.

Packard parts and service manager, J. A. Carr, declared: "Guesswork by the service salesman and trouble-hunting by the mechanic are entirely eliminated." The program now being explained to Packard's field service forces consists of consultation, examination, diagnosis and finally prescription. After the owner lists the symptoms in consultation with the service salesman, the patient goes under precision instruments to locate the source of the difficulty. These test results go to the car's owners who then determine how thoroughly they want to follow the prescription, decide whether Junior is worth the ring job or not.

Karl Greiner, Packard's vice president and general sales manager, has not suggested that prospective Packard owners should bypass their local dealers and buy their new cars directly from the factory as was stated in this column last week. Announcing the "gift wrapping" plan for cars scheduled for customer driveway, he said car buyers from distant points "will often take delivery at the factory, after purchasing at their local dealer, and combine saving of transportation costs with a vacation trip to the motor capital."

Wide World

AUTOS FROM ISRAEL: First automobiles made in Israel are assembled in the new Kaiser-Frazer plant near Haifa. Spot welding underneath the body of autos in process is facilitated by a crane that lifts the entire car body in the air.

New Rambler Model Introduced

A new car has made its appearance in Nash showrooms, after having excited considerable sidewalk comment wherever it has been seen previously. Called the "Country Club," it is the fourth entry in the Nash Rambler series, the others being the convertible, station wagon, and "Suburban," this last having station wagon lines but not the simulated wood trim. Two other Ramblers are eventually expected to fill out the line-up.

"Country Club," a hard-top with open air features and sporty appearance, has been scheduled for introduction several times but each time has been waylaid by materials bottlenecks. Its primary difference from other Ramblers is in the design of side and rear windows. Door centerposts have been eliminated so that the airiness of a true convertible is duplicated. The rear window, in three sections, contains $5\frac{1}{2}$ square feet of glass. A distinctive note which sets it apart from hard-tops offered by other car makers (aside from size) is the angle at which the steel top joins the body side panels. In this particular, Nash departs from the usual tapered lines and angles the connecting section to parallel the forward-sloping line of the rear window and top.

Factory delivered price at Kenosha, Wis., is $1845.90.

K-F Starts Packet Assemblies

Assemblies for the Fairchild C-119 Packet have started to move down Kaiser-Frazer's Willow Run lines, and more than 700 companies have been enlisted in this phase of K-F's defense work.

Materials sources are being lined up for the Chase C-123 assault transports which will be produced by K-F in the place of the Packet when the current contract is wound up. Although currently equipped with two reciprocating engines, the Chase plane has also undergone testing using four J-47 turbojet engines. It has a cargo capacity of 20,000 lb.

K-F has floated a $25 million "V" loan from three private banks to be used in financing its defense work, exclusive of the C-123. Financing for the latter is being arranged by Chase Aircraft Co. Inc., in which K-F recently bought 49 per cent interest.

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rear wheel ball bearing—
originated and developed
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New Departure Rear Wheel Bearings
never need lubricating or adjustment
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Completely sealed against dirt
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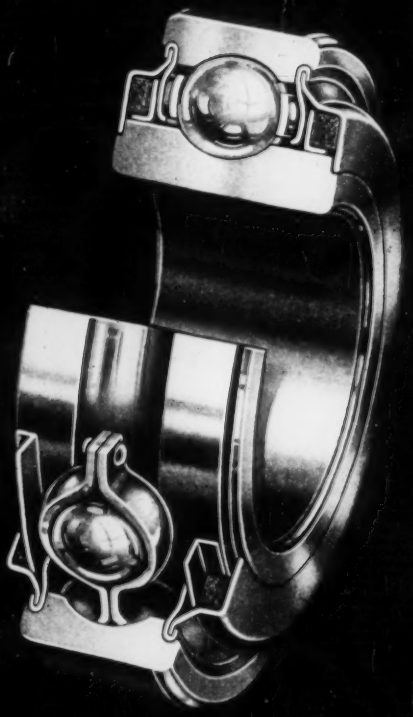

Nothing Rolls Like a Ball...

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

143

Which tube steel is the one and only for you? Ask the experts!

This month's report is on: **SICROMO 5S**

High degree of surface stability under oxidizing conditions up to 1500°F., makes it excellent for air preheater tubes, recuperator and superheater tubes, incinerator equipment. In cracking tubes, offers good resistance to corrosion by hot petroleum and excellent stability up to 1300°F.

23 TIMKEN STEELS FOR HIGH TEMPERATURE SERVICE

Carbon	Sicromo 2	Sicromo 5S	16-13-3
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	25-20
DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-12
Silmo	Sicromo 3	Sicromo 9M	35-15*
DM	4-6% Cr.-Mo.	18-8 Stainless	16-25-6*
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	

**Not available as seamless tubing at the present time.*

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Let our "RSQ"—Research, Supply, Quality—solve your tube problems. Ask the experts! The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Photo shows furnaces in the Timken Company's experimental heat treating laboratory. Pioneering research on high temperature steels' properties is one big reason for the Timken Company's leadership.

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The Business Trend

Industrial activity index flows along at high tide characteristic of second quarter as defense program enters its second year

PLENTY of zip is found in the nation's productive economy after a year of gradual defense build-up. The changeover to arms production—remarkably smooth so far—has been characterized mainly by enlarging of physical capacity and tooling up of plant facilities. Strengthening of military potential rather than production of finished goods has been emphasized. Last year at this time, industry was sailing along smoothly on the steady wind of unsatisfied civilian demand. Today in charting the economic course, the prevailing wind is the defense program. And as the nation enters its second year of semi-war, the wind is blowing harder.

While past trends are analyzed and future patterns explored in STEEL's Midyear Review and Forecast (pp. 45-48), the present production trend remains one of strength and stability. Industry is flowing along at the high tide characteristic of 1951's second quarter. The week ended June 23 was no exception: STEEL's activity index moved up one point from the 219 mark set the week before to 220 per cent of the 1936-1939 average. This was one point higher than the 219 reached in the similar 1950 week. But there is a noticeable switch of production emphasis, reflecting the change of economic course. Of the four components of the activity index, the automobile assembly component has shown a sizable decline of 12 points. Steelworks operations are up 5 points over last year; freight carloadings, though slightly higher, lend the same weight; and higher electric power output makes up the other seven points caused by the auto assembly deficit, plus the extra one.

Steel Breaks Three Records . . .

The call to arms last June got an encouraging answer from the steel industry. In the year since the start of the Korean war, more than 104 million tons of the vital metal have been poured, leaving a trail of broken output records. The American Iron & Steel Institute reported the four-month cycle of record high production would be continued in the last week of June, with schedules calling for the making of 2,055,000 tons of ingots and steel for castings. In each of the three preceding weeks, 2,063,000 tons were turned out. With June production estimated at about 8,800,000 tons, new quarterly, semi-annual and month of June production records should be established.

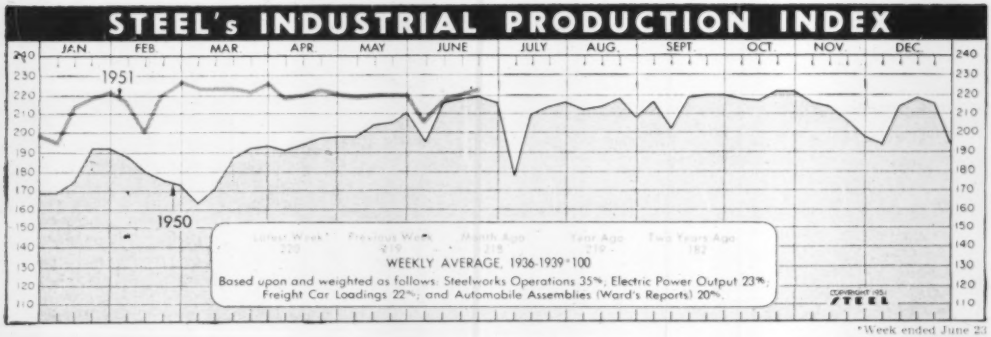
Autos Race Against Time . . .

Unlimbering of weekly production schedules was evident in the automotive industry, as major producers strove to attain maximum output before stiffer materials controls went into effect July 1. Although the gain was slight, output in the week ended June 16 climbed to the highest point since late April, says *Ward's Automotive Reports*, pointing up the narrow avenue assemblies have traveled throughout the second quarter. And in the week ended June 23, U. S. and Canadian plants should have bettered their previous week's turnout of 157,026, with schedules calling for 159,443 car and truck assemblies.

On a combined car-truck basis the industry's January-June yield will be well over last year, totaling 3,883,000

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	103.0	103.0	103.5	101.0
	Electric Power Distributed (million kilowatt hours)	6,835	6,747	6,653	6,102
	Bituminous Coal Production (daily av.—1000 tons)	1,717	1,654	1,620	1,727
	Petroleum Production (daily av.—1000 bbl)	6,192	6,189	6,163	5,355
	Construction Volume (ENR—Unit $1,000,000)	$207.4	$206.9	$177.1	$256.2
	Automobile and Truck Output (Ward's—number units)	159,443	157,026	158,259	205,334
	*Dates on request. †Weekly capacities, net tons: 1951, 1,969,035; 1st half 1950, 1,966,265; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	820†	826	812	810
	Business Failures (Dun & Bradstreet, number)	180	130	191	147
	Currency in Circulation (in millions of dollars)‡	$27,479	$27,499	$27,251	$26,926
	Department Store Sales (changes from like wk. a yr. ago)‡	+1%	-3%	+1%	+6%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$17,809	$15,066	$16,374	$15,885
	Federal Gross Debt (billions)*	$254.4	$254.6	$254.8	$256.3
	Bond Volume, NYSE (millions)	$11.8	$13.3	$17.1	$16.3
	Stocks Sales, NYSE (thousands of shares)	5,711	6,165	8,780	8,046
	Loans and Investments (billions)†‡	$69.5	$69.0	$69.6	$67.3
	United States Gov't. Obligations Held (millions)†‡	$30,555	$30,207	$30,125	$36,505
	Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index†‡	171.92	171.92	171.92	156.58
	STEEL's Nonferrous Metal Price Index†	226.0	232.7	241.6	182.7
	All Commodities†	181.6	181.7	182.4	157.4
	Metals and Metal Products†	188.2	189.0	189.5	171.9
	Bureau of Labor Statistics Index. 1926=100. †1926-1929=100. ‡1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC
1951
1950
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1951 STEEL

*Week ended June 23

against 3,766,000 in the first half of 1950. High level of truck manufacturing adds a lot of weight to this total. If June's expected unit volume of 485,000 passenger cars materializes, the six-months' total will be 3,097,000 units. Last year's January-June output established an all-time first-half record of 3,106,911 assemblies.

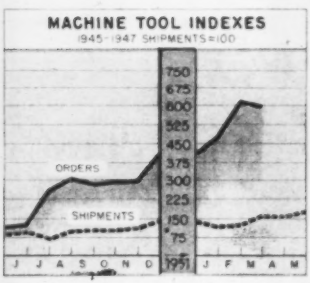
Plant Awards Low Again . . .

Seemingly stuck at the $207 million low mark of the previous week, engineering construction volume reached that amount again in the week ended June 21, reports *Engineering News-Record*. The figure of $207,449,000 is 26 per cent under the average week to date this year. Industrial building continued to drop, recording only $27 million in the latest period, down $4 million from the preceding week's volume.

Industrial building construction costs held steady in the second quarter, says the Austin Co., Cleveland. Its index of industrial building costs remained at 182 per cent of the 1926 average during that period as softened prices on some products offset limited advances in other building materials. May building permit values, as measured by Dun & Bradstreet Inc., jumped 17 per cent in May to a total of $435,908,489 for 215 cities included in the compilation.

Welcome Breather for Coal . . .

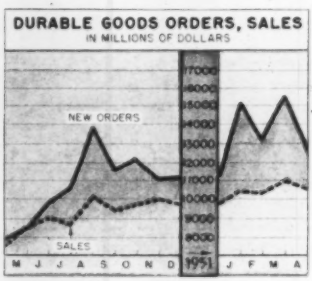
The ten-day miners' holiday, beginning this week, should give producers a chance to balance stocks with current demand. On a long-term basis, expanding requirements of utilities are expected to help counterbalance loss of business caused by railroad dieselization. In the third quarter, impact of accelerated defense orders is expected to be felt along with the usual seasonal pick-up in retail-industrial orders. On a weekly basis, miners are approaching



Machine Tool Indexes

	New Orders 1951	New Orders 1950	Shipments 1951	Shipments 1950
Jan.	475.4	99.7	114.3	52.8
Feb.	615.5	89.2	123.8	56.1
Mar.	591.8	107.4	158.9	75.3
Apr.		98.9	157.7	61.6
May		116.4	174.9	82.5
June		124.1		91.9
July		253.1		68.3
Aug.		305.1		95.2
Sept.		280.6		101.6
Oct.		289.6		100.9
Nov.		291.9		110.9
Dec.		410.1		135.7

National Machine Tool Builders' Assn.

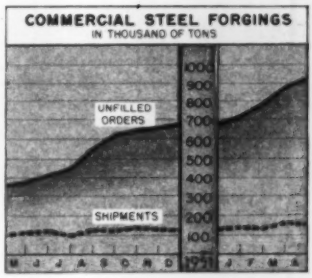


Durable Goods Orders, Sales

In Millions of Dollars

	New Orders 1951	New Orders 1950	Sales* 1951	Sales* 1950
Jan.	15,123	7,479	10,398	6,817
Feb.	13,153	7,213	10,338	7,103
Mar.	15,478	8,508	10,993	7,643
Apr.	12,551	7,857	10,540	7,488
May		8,514		8,605
June		9,814		9,030
July		10,553		8,670
Aug.		13,863		10,060
Sept.		11,509		9,392
Oct.		12,171		9,671
Nov.		10,621		9,730
Dec.		11,379		9,794

* Seasonally adjusted. U. S. Office of Business Economics



Commercial Steel Forgings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders 1951	Unfilled Orders 1950
Jan.	138	93	709	327
Feb.	129	93	781	341
Mar.	161	109	875	350
Apr.	134	99	924	357
May		114		373
June		117		408
July		95		446
Aug.		124		548
Sept.		122		620
Oct.		137		643
Nov.		139		657
Dec.		128		674

U. S. Bureau of the Census

Charts—Copyright 1951, STEEL

their 1950 pace, and in the week ended June 16 turned out 10,300,000 net tons of bituminous coal, according to the National Coal Association. That's a 4 per cent boost from the 9,925,000 tons mined the week before. Coal marketers are nervously eyeing the railroads' bid for a freight rate increase, as they are having plenty of trouble with competitive fuels at present prices.

Shorter Hours, More Jobs . . .

Average workweek in the nation's factories declined by nearly one-half hour between mid-April and mid-May to 40.6 hours. This was about the level prevailing at the start of the Korean war, says the Bureau of Labor Statistics. Consumers goods makers suffered most, because of metals restrictions and slackened demand.

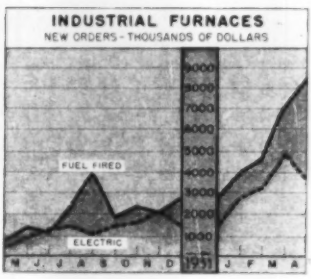
But May job placements reported by the Labor Department's Bureau of Employment Security rose sharply under the influence of strong seasonal demand for farm workers and accelerated hiring in manufacturing, construction and trade. May placements totaled 1,343,200, more than double April's figure of 659,900. Over 3 million persons have been added to civilian employment and to the armed forces during the past 12 months, creating the tightest balance between labor supply and demand since the end of World War II.

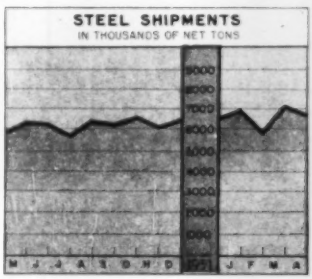
Trends Fore and Aft . . .

Electric utilities will report record sales and revenues for the first half, but higher taxes and costs will push earnings slightly below the like period last year. . . Textile weavers expect to curtail their production further because of the extended weakness in demand. . . Prices moved sideways in the week ended June 19 to 181.6 per cent of the 1926 level, a drop of 0.1 percentage point from the previous week. . . Railway operating revenues in May were 16 per cent higher than those of May, 1950. . . American Gear Manufacturers Association index dropped 10.2 per cent in May to 667.1 per cent of the 1935-1939 average. . . International Harvester Co. reduced prices of its light model trucks and attachments.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction	June25	Gray Iron Castings	May28	Ranges, Elec.	June11
Employ., Metalwkg.	June18	Indus. Production	June25	Ranges, Gas	June4
Employ., Steel	June25	Ironers	May14	Refrigerators	June18
Fab. Struc. Steel	June4	Malleable Castings	May28	Steel Castings	May28
Foundry Equip.	June18	Prices	June25	Vacuum Cleaners	June4
Freight Cars	June18	Purchasing Power	June4	Wages, Metalwkg.	June18
Furnaces, W. Air	May28	Pumps, New Orders	June11	Washers	May14
Gear Sales	June11	Radio, TV	June11	Water Heaters	June25





Industrial Furnaces
New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1951	1950	1951	1950
Jan.	4,033	3,914	2,764	473
Feb.	4,670	616	3,212	697
Mar.	7,019	1,300	4,846	753
Apr.	8,497	837	3,657	415
May		1,392		982
June		1,166		1,328
July		2,247		1,445
Aug.		3,927		1,039
Sept.		1,817		1,485
Oct.		2,306		1,693
Nov.		2,168		2,157
Dec.		2,749		1,505

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

Steel Shipments
Net Tons

	1951	1950	1949
Jan.	6,904,688	5,482,691	5,788,632
Feb.	5,776,229	5,134,780	5,519,938
Mar.	7,105,078	5,723,340	6,305,681
Apr.	6,634,510	5,789,453	5,596,786
May		6,252,672	5,234,862
June		6,192,438	5,177,259
July		5,668,898	4,534,855
Aug.		6,326,464	4,918,314
Sept.		6,145,354	5,236,196
Oct.		6,503,531	935,037
Nov.		6,051,145	3,296,809
Dec.		6,432,776	5,410,902

American Iron & Steel Institute

THIS TIME IT'S

NACOGDOCHES, TEXAS

Over in the prosperous timber and agricultural belt of east Texas, the city of Nacogdoches is looking and planning for further growth. Needing more water, municipal officials called in Layne and ordered the installation of another deep well and pump unit, —the third since 1925. With this new unit in operation, the city now has a greater supply of water than is presently needed.

These three Layne installations extending back for more than a quarter century, have had every opportunity of failing,—or proving their value in high efficiency, long life and absolute dependability.

Congratulations to Nacogdoches for the continued and exclusive use of the world's finest wells and pumps.

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

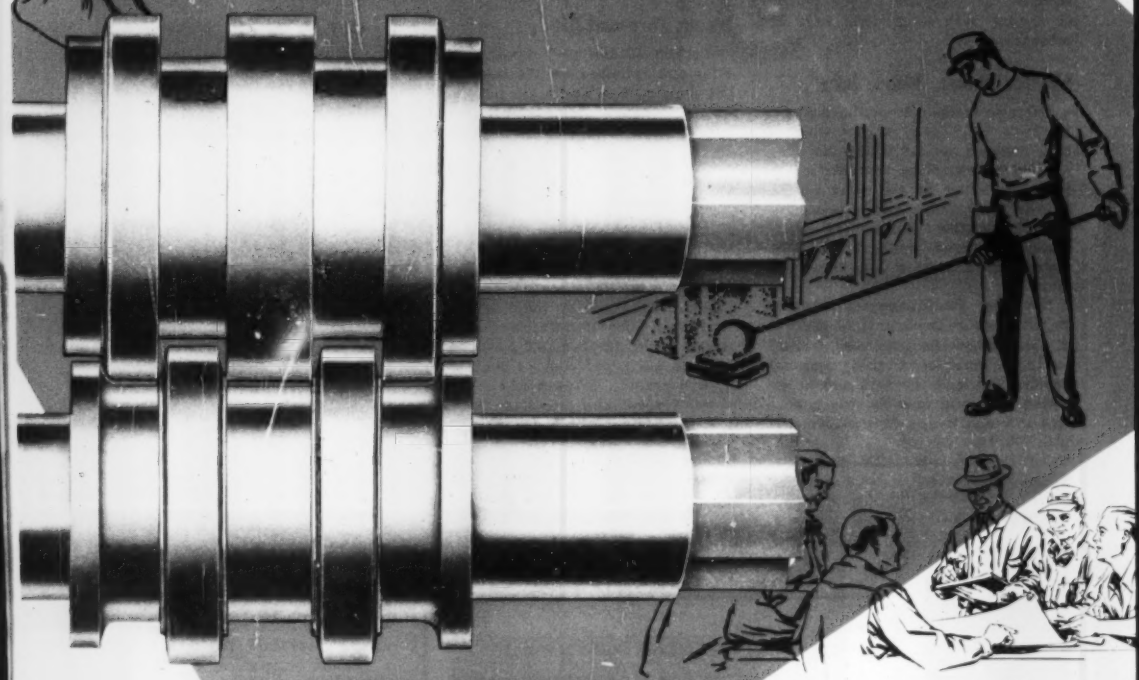
ALL PURPOSE PUMPS

Layne's new catalog on Short Coupled Service Pumps will be sent on request. It fully illustrates the many practical applications of these wonderfully efficient all purpose pumps.

Layne
WATER SUPPLY
WELLS & PUMPS

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



get high tonnage because of INTEGRATED PROCESS CONTROL

Select from any of these eleven types of Ohio Steel and Iron Rolls:

- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Holl-O-Cast Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Flintuff Rolls
- Alloy Chilled Iron Rolls

Every step of the way through production, the quality of your rolls is insured by the group talent of Ohio Steel's PROCESS CONTROL unit. They take over when your order is received. In every phase of manufacture, the same group of metallurgists, chemists, engineers and inspectors follows the progress of your order. They know what has gone before and what remains to be done. Under their direction your rolls are made. And the result is as close to perfection as is possible.

THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

R. EDWARD STEIN
Lewis Welding & Engineering V. P.

R. Edward Stein was elected vice president in charge of manufacturing, **Lewis Welding & Engineering Corp.**, Cleveland. He joined the company in 1941 as an engineer. He became works manager of its welding division in Bedford, O., in 1946. Early in 1950, after acquisition by the company of the Euclid, O., plant of Joy Mfg. Co., Mr. Stein was appointed general works manager of both the welding division in Bedford and the new machine division in Euclid.

E. Horton & Son Co., Windsor Locks, Conn., elected **R. S. Cooper** as president, and **D. B. Huntting**, former president, as chairman of the board.

Robert L. Cahoon was named assistant manager, clad and conversion sales, **Lukens Steel Co.**, Coatesville, Pa.

Michael Dufal, purchasing agent and production manager of **Universal Lubricating Systems Inc.**, Oakmont, Pa., was elected vice president. He joined the company in 1942 as foreman of the automatic screw machine department and was later promoted to plant superintendent.

Riverside Metal Co., Riverside, N. J., appointed **John Gribbel II** as vice president, assistant to the president; and **Leslie G. Carter**, formerly treasurer, as secretary-treasurer. Mr. Gribbel, formerly secretary, was sales manager for the Philadelphia district of American Meter Co. before joining Riverside six months ago.

Refractories Institute, Pittsburgh, announces appointment of **Avery C. Newton** as executive secretary.

JOHN J. BRICKER
IBM director of purchasing

John J. Bricker was appointed to the newly established post of director of purchasing, **International Business Machines Corp.**, with headquarters in New York. He was IBM manager in Hartford, Conn.

Donald I. Bohn, chief electrical engineer of Aluminum Co. of America, Pittsburgh, was awarded the 1950 Benjamin G. Lamme Gold Medal by the **American Institute of Electrical Engineers.** The award was made June 25 in Toronto, Canada, at the opening session of the institute's five-day general summer meeting.

Frank L. Munsey was appointed assistant plant manager of the Sandusky, O., plant of **New Departure Division**, General Motors Corp. He was factory manager, **Raoul L. Larue** succeeds to the latter position.

Merten C. Peterson was named Chicago district manager, automotive division, **Warner Electric Brake & Clutch Co.**, Beloit, Wis. He has served as regional sales manager for Willys-Overland Motors Inc., and vice president of Flex-O-Tube Co. His office in Chicago will be at 80 E. Jackson Blvd.

Harry F. Gracey has been added to the consulting staff of **Edward N. Hay & Associates Inc.**, Philadelphia. He formerly was associated with SKF Industries Inc.

Milton C. Sulander was appointed general manager, and **Henry Thompson**, chief engineer of **Instrument Gear Works**, Chicago, to succeed the late **John M. Graven**, founder of the company.

EUGENE M. LANG
Heli-Coil V. P.-mfg.

Heli-Coil Corp., Long Island City, N. Y., elected **Eugene M. Lang** vice president in charge of manufacturing. Mr. Lang, former works manager at the Heli-Coil plant, has served the firm in various executive and production capacities since 1941.

H. V. Churchill, chief of the analytical division of **Aluminum Co. of America's** research laboratories in New Kensington, Pa., has retired. He is succeeded by his son, **J. R. Churchill**, who has been his assistant since 1944.

Albert F. Hills, former executive vice president, was elected president of **Crouse-Hinds Co.**, Syracuse, N. Y. He succeeds the late **Huntington B. Crouse Jr. W. Cornell Blanding** was elected executive vice president and **John R. Tuttle** was promoted from secretary to vice president and treasurer.

Ralph M. Johnson, vice president in charge of sales, Norton Co., Worcester, Mass., was elected president of **American Supply & Machinery Manufacturers Assn.**

Revere Copper & Brass Inc., New York, appointed **Jack C. Hurst** as divisional sales manager of its Pacific Coast Division, and **Theodore F. Richardson** as district manager of the San Francisco office. The Pacific Coast Division is located in Los Angeles.

Purchasing Agents Association of New York elected as president **Edward A. Bantel**, purchasing agent for National Bureau of Casualty Underwriters. He succeeds **R. Park Lamborn**, general purchasing agent,

Kennecott Copper Corp. Elected vice presidents are: **John F. Snedeker,** Binney & Smith Co., and **M. D. MacBurney,** Barrett division, Allied Chemical & Dye Corp.

Paul E. Rosenbaum was appointed as direct representative for Missouri, Nebraska, Kansas and portions of Iowa and Illinois for **Billings & Spencer Co.,** Hartford, Conn. He will make his headquarters in St. Louis. **William G. Clark** is representative in Michigan, headquartered in Detroit.

Luther Harris was elected vice president of production of **Pacific Airmotive Corp.,** Burbank, Calif.

Thomas N. McGowen was elected chairman of the executive committee of **Sundstrand Machine Tool Co.,** Rockford, Ill. He has been a director of the company since 1929.

Jesse J. Booth was appointed assistant to the general superintendent, and **Frank O. Phillips** as division superintendent of maintenance, **Duquesne Works,** United States Steel Co., Duquesne, Pa.

Thomas E. Akers was elected president, and **Maurice N. Trainer,** chairman of the board of Dominion Brake Shoe Co. Ltd., Montreal, subsidiary of **American Brake Shoe Co.,** New York. **Kenneth T. Fawcett** was appointed vice president of American Brakeblok and Kellogg Divisions of the company. Mr. Akers, formerly vice president, Dominion Brake Shoe, joined the parent company in 1902. Mr. Trainer, who is president of American Brake Shoe Co., was formerly president of Dominion Brake Shoe. Mr. Fawcett will continue to serve as vice president of Dominion, and as vice president of Brake Shoe Division.

THOMAS E. AKERS
Dominion Brake Shoe president

ERNEST R. JACOBSEN
V. P. sales, Paul & Beekman Inc.

Ernest R. Jacobsen was named vice president in charge of sales for **Paul & Beekman Inc.,** Philadelphia, contract manufacturer of metal stampings and assemblies. He formerly was sales manager. He had former association with Gould National Batteries Inc. **James A. Fritts** was appointed vice president and works manager.

Frank A. Stevens Jr. has joined the sales staff of **Phelps Dodge Copper Products Corp.,** and will operate out of the Boston office.

J. M. Kaplan, president of Welch Grape Juice Co., and **M. D. Safanie,** a partner in Shearson Hammill & Co., have resigned from the board of **Sharon Steel Corp.,** Sharon, Pa. Both were elected to the board in March. Succeeding them are **Duncan R. Linsley,** First Boston Corp., and **Frank J. Manheim,** Lehman Bros.

Hotpoint Inc., Chicago, appointed **W. R. Hall,** Boston district manager, to replace **F. L. Cashman,** resigned. **J. H. Kidd** becomes zone manager in Dallas; **V. P. Owen,** zone manager in Philadelphia; and **L. W. Hitchcock,** zone manager at Cleveland.

MAURICE N. TRAINER
chairman of Dominion Brake Shoe

JAMES A. FRITTS
Paul & Beekman V. P.-works mgr.

Pontiac Motor Division, Pontiac, Mich., General Motors Corp., named **John C. Harbaugh** assistant general service manager, replacing **C. L. Bates,** who was appointed assistant manager of Pontiac's Cincinnati zone.

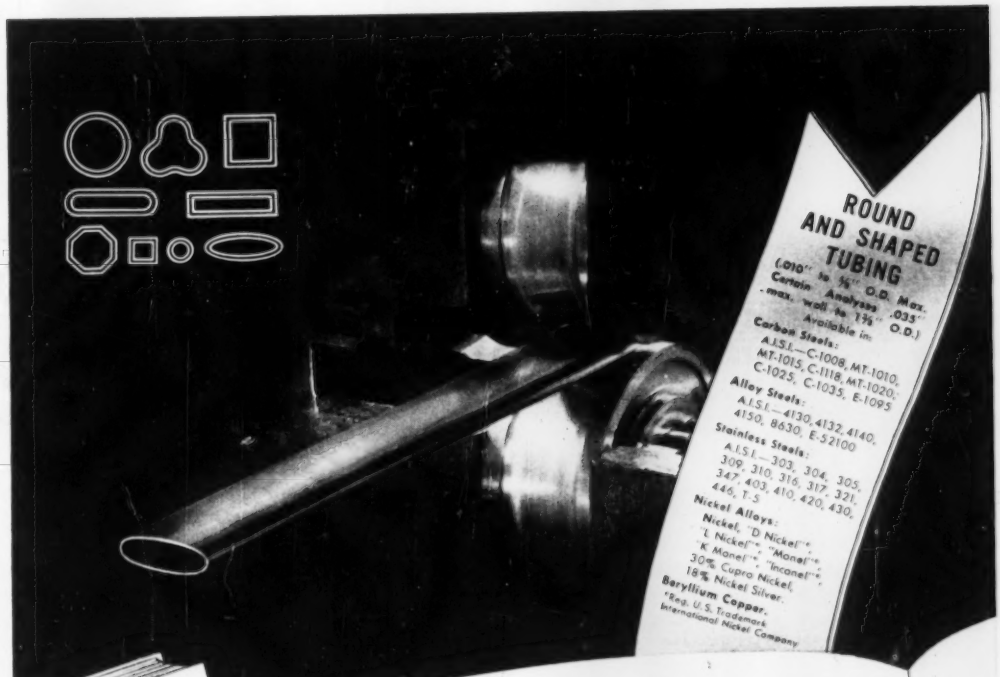
William M. Tobin was named manager of the Washington branch of **White Motor Co.** He was branch manager for White in Brooklyn, N. Y. Mr. Tobin succeeds **C. I. Fraley,** who becomes wholesale manager in charge of the Virginia and Maryland territory.

Heresite & Chemical Co., Manitowoc, Wis., elected: **Ira L. Place,** vice president and assistant general manager; **D. J. MacGillis,** general sales manager; **Rudy Stockinger,** district sales manager, Wisconsin, Michigan, Minnesota; **Robert Riha,** assistant sales manager; **Melvin Young,** plant superintendent; and **Otto Kollath,** superintendent, chemical division.

William T. McGinnis was appointed assistant to the president, and **L. W. Coquillette** as assistant to the vice president of **Keokuk Electro-Metals Co.,** Keokuk, Iowa. Mr. McGinnis was manager and vice president of Pacific Northwest Alloys Inc. before joining Keokuk. Mr. Coquillette managed the Keokuk office of the accounting firm of McGladrey, Hansen & Dunn & Co.

Robert J. Carroll was named assistant advertising manager, **Illinois Tool Works,** Chicago. He will also assist in handling advertising of Shakeproof Inc., a division.

Albert H. Brandel was promoted from


ROUND AND SHAPED TUBING
(.010" to ⅝" O.D. Max. Certain Analyses .035" max. wall to 1⅜" O.D. Available in:
Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095
Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100
Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5
Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.
Beryllium Copper.
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The HOLE Story —by— Superior

Chapter 1

Shaping a Heart for a Pressure Gauge Requires "Technology in Tubing"

Soon after the tube pictured above comes off the shaping roll, it will be processed into a Bourdon tube, the heart of a pressure gauge, by one of our customers.

The design of a gauge movement and the skill of the gauge builder have a bearing on its accuracy. But nothing can compensate for an irregularly responding Bourdon tube.

That's where Superior comes in. The metallurgy of the tube, its dimensional precision and physical characteristics are all critical . . . and all are rigidly controlled at Superior.

This rigid control is applied to all tubing produced by Superior.

For example, in the production of seamless steel tubing for hydraulic applications, industry standards permit a carbon range of .08 to .18%. This range is not good enough for Superior. Aiming for a carbon content of .12%, Superior Hydraulic Quality tubing is always held to .15% maximum. This insistence on adherence to strict standards applies equally to dimensional tolerances.

Superior produces tubing to rigid specifications year in and year out. We have the engineers, metallurgists, research, production and test facilities that it takes to draw the highest quality small tubing in the widest variety of analyses.

You can call this combination of facilities, men, methods and machines "know-how" . . . or you can call it experience. But whatever you call it the result is always fine small tubing to do a better job for you.

SUPERIOR TUBE COMPANY, 2005 Germantown Avenue, Norristown, Pa.

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

Superior
THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅝" O.D.
Certain analyses (.035" max. wall)
Up to 1⅜" O.D.

NEW GRINDER SAFETY with GREATER POWER

INGERSOLL-RAND *introduces* ANOTHER BIG FIRST... *the* NEW OVERSPEED SAFETY COUPLING....

The Overspeed Safety Coupling supplements, and is completely independent of, the regular factory-set weight type governor used in Ingersoll-Rand Air Tools.

This built-in unit, which operates in case of failure of the regular governor, eliminates the possibility of dangerous overspeed operation. If, for any reason, the motor speed exceeds the safe wheel speed, the NEW Overspeed Safety Coupling automatically uncouples the arbor and the wheel from the motor, making it impossible to operate the Grinder until the cause of overspeeding has been corrected.

GRINDER OPERATORS *Also Asked for* THESE *Extra* FEATURES

LONG LIFE ARBOR CONSTRUCTION—Widely spaced, permanently lubricated, precision ball bearings are located at each end of the arbor in a one-piece housing to provide new rigidity and longer Grinder life.

20% MORE POWER—A new, larger, four-vane, swastika-type motor gives 20% more power. Extensive use of light weight alloy castings results in more horsepower per pound. Grinding efficiency goes up and grinding costs come down.

QUIETER EXHAUST—It takes 10 of these new Grinders to produce exhaust noise equal to 1 of the previous machines. The low exhaust noise which is present, is pitched so as not to be irritating.

EXTRA EXHAUST POSITIONS—The operator can choose any one of four exhaust positions, spaced 90 degrees apart.

RUBBER-FACED VALVE—The new composition rubber-faced throttle valve closes properly even if small particles of foreign matter adhere to the valve seat. Replacement is inexpensive, and no lapping is necessary.

OPTIONAL HANDLE—In addition to the popular grip handle, a straight handle with a new safety-throttle lock is available.

Call us today and arrange for a demonstration of this powerful new Series 4 Air Grinder.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

630-B

production manager to assistant to the works manager, **Oldsmobile Division,** General Motors Corp., Lansing, Mich. **Floyd V. Burr,** assistant production manager, will succeed Mr. Brandel, and **A. Victor Brown** was appointed Mr. Burr's successor. **Harry A. Kane** succeeds Mr. Brown as superintendent of materials handling.

Air Reduction Sales Co., a division of Air Reduction Co. Inc., New York, appointed **Edward H. Roper** as manager of the general technical sales department.

John C. Cotner, president of Hydraulic Press Mfg. Co., Mt. Gilead, O., was elected director of the machinery division of the **Society of Plastics Industries Inc.**

Donald E. Jahncke was appointed resident controller of the new gas turbine plant, **Lincoln-Mercury Division,** Ford Motor Co., Detroit. Associated with the division since 1948, Mr. Jahncke was assistant manager of the financial analysis department for the last two years, and previously was manufacturing budget administrator.

Duraloy Co., Scottdale, Pa., appointed **A. M. Miller** as district manager of its Detroit sales office. He had been in charge of operations at Scottdale.

Dr. Robert D. Huntoon was appointed associate director of the **National Bureau of Standards,** Washington, in charge of its newly established Corona Laboratory near Corona, Calif. He was formerly chief of the NBS atomic and radiation physics division. The Corona laboratories will be concerned with various phases of electronic research, development and engineering. The first NBS unit to be transferred to Corona will be the Guided Missiles laboratory which will develop missiles under the sponsorship of the Department of Defense.

H. H. WUNDERLICH

. . . J&L asst. V. P.-general services

L. L. ANDRUS

. . . heads American Wheelabrator div.

H. H. Wunderlich was appointed assistant vice president-general services, **Jones & Laughlin Steel Corp.,** Pittsburgh. Since Feb. 1, 1950, he has been acting as director of budgets. He joined J&L in 1923.

H. D. Palmer was elected president of **Detroit Steel Products Co.,** Detroit, to succeed the late **W. C. Owen.** With the company since 1922, Mr. Palmer was a vice president, secretary and director. **C. Garritt Bunting** was elected secretary and continues as assistant treasurer.

William H. Holding was appointed industrial sales manager for both the Stamford, Conn., and Salem, Va., divisions of **Yale & Towne Mfg. Co.** Formerly East Coast regional manager of industrial sales, Mr. Holding was named to his new post to succeed **A. Charles Amann,** general sales manager. In the Philadelphia division, **Norman R. Amberg** was appointed assistant works manager, and **Harvey W. Wesenberg,** supervisor of materials handling.

Joseph J. Nagy was named Detroit factory manager, **Wolverine Tube Division,** Calumet & Hecla Consolidated Copper Co. Inc.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., announces personnel changes and additions as follows: **L. L. Andrus,** formerly vice president-sales, is now vice president and executive head of the dust and fume division. **John A. Silver** joined the company as director of sales. **E. B. Rich** becomes general sales manager. **A. E. Lenhard,** advertising and sales promotion manager, assumes new responsibilities. **S. S. Deputy,** sales manager, will work with the general sales manager on special assignments. **Bernard Lester** of Lester & Silver, management and sales consultants, will continue as a sales management consultant to the sales division and to general management.

John Lawrence, formerly technical vice president in charge of manufacturing, engineering and research, SKF Industries Inc., was elected a vice president, in charge of manufacturing at all plants of **Joy Mfg. Co.,** Pittsburgh.

IBM World Trade Corp., Toronto, Canada, subsidiary of International Business Machines Corp., elected **John C. Folger** of Washington as director.

OBITUARIES . . .

Ralph P. Fahey, 52, general sales manager in charge of service and advertising of the Electric Shaver Division of **Remington-Rand Inc.,** New York, died June 25 at his home in Norwalk, Conn.

Edwin H. Parkhurst, 79, since 1937 president of **Euclid Road Machinery Co.,** Cleveland, and for 14 years before that president of Columbia Axle Co., died June 22.

Clarence R. Johnson, 61, district representative for the western sales division of **Caterpillar Tractor Co.,** Peoria, Ill., died in Sacramento, Calif., June 13.

Mrs. William A. Ainsworth, for the last seven years president of **Ainsworth Dyeing Machine Co.,** Utica, N. Y., which was founded by her husband, died June 18.

William T. Harrison, 66, who formerly operated a foundry in Portland, Oreg., died at his home in Buffalo, June 15. He was associated with **Bos-Hatten Corp.** in Buffalo prior to retiring last October.

John Swenehart, 59, director of advertising and public relations for **Atlas Powder Co.,** Wilmington, Del., died June 16.

Herbert P. Slee, 67, secretary of the central New York branch of **National Metal Trades Association,** died June 21 in Syracuse, N. Y.

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Production and Engineering
NEWS AT A GLANCE

BORON TO THE RESCUE— Warning flags being waved furiously from Washingon over the critical alloy situation are focusing attention sharply on the newer series of boron treated constructional steels which provide equivalent hardenability at half the alloy content or less. Thousands of tons of the original boron steels introduced during the last war have been processed successfully into products such as crankshafts, wrenches, bolts and hand tools. They have shown better hot and cold working properties, shorter annealing cycles, less scaling, improved machinability and lower tempering temperatures. In recent years carburizing grades have been introduced, and this year saw the birth of the 80Bxx and 81Bxx series, along with 94B17, 43B17 and 86B45 analyses. Users of heat treating steels should keep closely posted on the boron steels for they are inevitable alternates in view of the alloy criticality. The big problem is in the hands of steel producers faced with stepping up their tonnage of boron heats on the grand scale. —p. 78

EXPLOSION-BULGE— Metallurgists at the Naval Research Laboratory are testing welded sections of heavy steel plate by bulging them with an air blast set up by detonation of an explosive. Welded deformations produced in this way have provided basic information needed for an approach to fracture problems.

SURFACE BLACKOUTS— *Chemical dips are available for applying dense black finishes to iron, steel, zinc or cadmium, either as a bond for subsequent paint, or as a final finish color. Immersion bath for steel is operated at 300 °F, for zinc at 150-180 °F and cadmium at 140 °F. Processes are simple, equipment inexpensive.*

FOR CLEANER COAL— Mechanical mining and loading of coal, while greatly conserving manual labor, produce higher percentages of fines and include more refuse material. Mechanical cleaning equipment has been in use for more than 20 years and generally is doing an acceptable job; however, separation processes of the heavy media type, although costly, may come into wider acceptance if coal users will pay the price for the quality of coal they need. Froth flotation of fines, widely used in Europe, is due to increase at U.S. mines. —p. 84

PRODUCTION PLANNING PAYS— Realization of a 25 per cent saving in manufacturing costs through a carefully conceived system of production control is readily possible in a plant where this technique has not been used. Requirements are: Accurate estmates of annual sales potentials, translated into a master production schedule; bills of material for each product unit; operation and process sheets; and stock record cards. Closely allied to production control is material control, in turn tied intimately to the purchasing department. Obviously a considerable amount of paper work must be handled in these control systems, but it has been proved to pay off; not only in terms of lower costs but also improved customer relations accruing from efficient order handling and deliveries.—p. 74

RECYCLE PICKLING WASTES— Concerned over shortages of sulphur and sulphuric acid, British engineers are probing the reclamation of pickling wastes by the "autoxidation" process, a method for the combination of sulphur dioxide and oxygen in aqueous solution. Spent liquor from a pickling line is treated for removal of most of the dissolved ferrous sulphate which is then converted in the autoxidation plant to sulphuric acid of sufficient strength so that when added to the mother liquors from the ferrous sulphate crystallizers it will produce a liquor of correct bulk and composition for feeding to the inlet end of the pickling system.

COPPER-CLAD ALUMINUM— Cupal is the name of a new copper and aluminum bimetal developed in the Allied zone of Germany and just brought to the U.S. by an eastern brass and copper company executive, along with exclusive processing and distribution rights. Basic material is aluminum, with a layer of copper welded to it by a specialized process, either on one or both sides, and then rolled to specific thicknesses. Advantages in terms of electroplating or soldering are obvious, as well as the savings in weight over pure copper. Electronic and communications equipment are seen as important outlets. Price schedule, to be announced in a few weeks, will be somewhat higher than copper per square foot.

OF CABBAGES AND KINGS: Gravimetric method for exhaust gas analysis, developed by the National Bureau of Standards, provides accurate data on the efficiency of the combustion process in jet engines . . . A 50-foot diameter 30-ton "saucer", made up of 25 pie-shaped sections of cast aluminum, has been mounted atop the naval research laboratory at Anacostia, Md., to serve as a combination radio-rifle and radio telescope . . . Short of hot-rolled strip, one autobody builder recently resorted to the costly practice of slicing up wide cold-rolled sheets for stock to make underbody stampings . . . British engineers have perfected a machine for automatic honing of forged Nimonic (75 per cent nickel) gas turbine buckets to 1.5 microinches in 45 seconds. —A.H.A.

Metalworking Outlook—p. 37 Market Outlook—p.131

Hidden Costs Exposed by

PRODUCTION and INVENTORY CONTROL

Accepted principles and techniques of production control can be utilized profitably in any manufacturing plant. The only variations required are in the detail applications of planning, scheduling, dispatching and material control

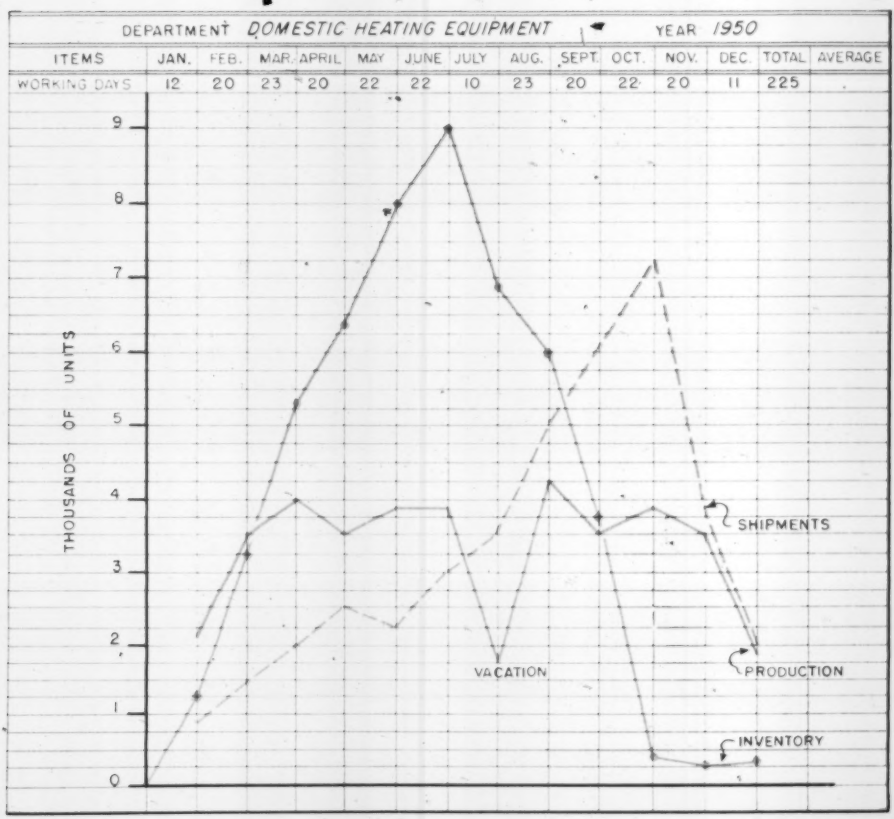
By S. A. PECK
Executive Vice President
Trundle Engineering Co.
Cleveland

IMPORTANCE of production and inventory control in assuring smooth operation of any manufacturing process can hardly be overemphasized. To many managers, sound control techniques are the most dependable tools they have for securing prompt, orderly and economical production.

Where does control start? Right at the top, in the sales and general management. For here must be determined what is to be made, how much, and when.

Master Plan Drawn—First comes the master plan or sales forecast, originated by the sales management and approved by top management after the plan's requirements in finances, product design and facilities have been carefully checked by their respective functions. The master plan may state that, in view of the expanding, (or conversely), the contracting market, x units of product A and y units of product B can be sold during the next fiscal year. And that the market's requirements will probably be higher toward

Chart showing shipments, production and inventory relationships in a plant manufacturing household heating equipment



the second half of the year than during the first half. The master plan may also state that inventory may be accumulated to whatever extent is necessary to keep the manufacturing facilities on a uniform production level throughout the year.

Next comes the sales schedule, which becomes in effect the master production schedule. It details by model and size the monthly shipments desired. Upon this basis, production control proceeds to develop a program of production and inventory that will satisfy the shipments required.

To do this, some specialized tools are needed. First, a bill of material, which describes in detail all the components of each product unit; second, an operation or process sheet, which tells the path of travel of each component through the plant, and contains such essential data as where each operation is to be done, what tools will be required, and what standard time is allowed for each operation; third, stock records cards, indicating what kind and how much raw material is available, and similarly for parts and finished products.

Schedule Set Up—From these records and forecasts the actual manufacturing schedule is made up which balances the requirements for inventory and shipments against the effective capacity of the plant. Thus are accomplished the first three basic elements of production control—planning, routing and scheduling. Dispatching then activates the schedule in either of two ways: By breaking the schedule down into short periods of time, a week or a month, and releasing them as work orders; or by issuing manufacturing orders for a given quantity of parts and releasing them in accordance with the schedule.

Principal difference between the two methods is that the weekly or monthly schedule is made up for each department, whereas the manufacturing order goes with the work from department to department. In both cases, the rate of production must be predetermined and the number of manufacturing units specified that will satisfy the schedule requirements, within the most economical lot quantity. The first case usually is used for stock manufacture, and the second for jobbing manufacturing.

The remaining element in production control, that of material control, also comes into effect as soon as the scheduling action is completed. This involves the procurement function, which is guided by the same principles in buying that planning was in developing the manufacturing lot quantities. Expressed in its own terms of material control this means that order quantities are determined by the following factors:

a. The time required for manufacturing the entire schedule requirement is quite short, or

b. The cost per unit is high, or

c. The storage space per unit is high compared to its value, or

d. The quantity required is very large.

Multiple Benefits — Production and material control necessarily requires much paperwork, both for communication as well as for residual records. In terms of the benefits to be derived, such additional detail procedure and effort is repaid many times over the cost of their operation.

How does an effective production control accomplish this? First of all, it secures the lowest possible cost of manufacturing the product from the available facilities. Low direct costs of labor and material are attained by continuously supplying the right material at the right place, at the right time, in the right quantity. If the scheduling, routing and dispatching have been properly accomplished, the maximum utilization of man and machine time has been provided for, with the minimum amount of material.

MACHINE LOAD SHEET

DESCRIPTION OF MACHINE	NO. OF MACHINES	DEPT	Mach. Nos.
Fay Automatic Lathe	2	25	404 410

REQUIREMENTS PER MONTH (Load factor based on 215 hrs. per month

ENGINE or SERVICE	PART NO.	PCS PER MO.	STD TIME per pc	Time Req. Cum Tot	LOAD FACTOR	Production Runs Pcs.	Time per pc	Total Time
E	H-9103-6	135	332	44 8	208			
S	"	15	.332	5 0 49 8	023 231			
E	H-9104-4	135	304	41 0 90 8	191 422			
S	"	15	304	4 6 95 4	021 443			
H	H-9195-1	1340	043	57 6 153 0	268 711			
S	"	100	043	4 8 157 8	020 731			

Typical machine loading form for mass production shop, covering automatic lathe operation

Low indirect cost, overhead or burden, which consists largely of fixed indirect labor cost, taxes, depreciation and similar fixed expenses or charges, results from the dilution of all these fixed indirect costs over the greater amount of production passing through the facilities to which these indirect costs apply.

Costs Cut 25%—The reductions in cost can be very large if control has been previously lacking. Reductions amounting to as much as 25 per cent in manufacturing costs can result from production control alone.

Secondly, production control, if properly administered, secures good customer relations by the improved service given them in order handling and deliveries. A company's volume may even double as a result of meeting customers' delivery requirements. A guaranteed delivery of material or parts means as much to a customer, who has his own problems of manufacturing and shipping, as it does to the vendor.

Lastly, are the financial benefits that result from good production and material control. Low costs mean more profits; more profits mean more dividends; more working capital, a better credit position; and more ability to weather changes in the economic cycle. Minimum inventory means an easy cash position and low degree of risk due to obsolescence of the product.

Examples Cited—A good example of how and why production control works is a manufacturer of household heating equipment. Its operation is characterized as being a seasonal stocking operation. Its shipping curve is bell shaped, with 10 per cent of the total volume in the first quarter, 20 per cent in the second quarter, 45 per cent in the third quarter, and 25 per cent in the fourth quarter. Its normal plant

capacity is 175 units per working day. The maximum shipping requirement during the third quarter is 18,000 units out of the year's requirement of 40,000 units. Because of the competitive pricing, costs must be kept low, precluding very much overtime or second shift operations. The industry expands slowly with population growth and facilities need a major addition only every decade. This concern made its last ten-year expansion in 1947.

How does the company meet this manufacturing problem? It maintains a well-organized, well-staffed production control department completely integrated as to procurement, planning, and inventory control. The total payroll of the department is $40,000 per year or $1 per unit produced. Its finished product warehouse can hold 12,000 completely finished units and raw material stores provide for a 90-day supply of sheets, pig and scrap iron, and other raw materials.

As soon as the sales forecast is approved in December for the following year, the manufacturing schedule is established on a basis usually of 225 working days. This provides a two-week plant-wide vacation period, a two-week shutdown over the year end, a two-week contingency period in December in case the sales forecast is not realized, and a 40-hour, five-day week the balance of the year.

Nothing Omitted—The rest is a simple matter of arithmetic. At an average monthly rate of production of 3800 units, and the quarterly shipment rate mentioned earlier, the manufacturing plan appears thus:—

	1st Q.	2d Q.	3d Q.	4th Q.
In Units Produced	11,400	11,400	9,500	7,700
In Units Shipped	4,400	8,000	16,000	11,600
In Units Inventory	7,000	10,400	3,900	0

Actually the plan is worked out on a monthly basis.

Maximum inventory—10,400—is reached at the end of June. Carrying an inventory excess equivalent to 25 per cent of annual sales, might be challenged as good business practice, in view of the carrying charges entailed. Actually they are small, since interest on borrowings and warehouse costs are the only principal factors involved, and an excess inventory itself exists for only six months of the year. These extra costs amount to less than 1 per cent of the sales dollar.

Mass Production Operation—An automotive manufacturer making internal combustion engines to order, but under its own brand name, is the second example. It is mass-production, nonstocking operation and has grown from an annual volume of $8 million in 1938 to $80 million in 1949. During the war, its volume was of course a good deal higher than this, reaching a maximum of $240 million in its biggest year.

The problems of production and material control are intricate and varied. The company manufactures a complete range of gasoline engines from fractional horsepower sizes to large 250 hp truck sizes, including marine, small aircraft and diesel engines, in five major plants. Monthly manufacturing schedule calls for 25,000 units, scattered over seven classes, 30 models, and 190 sizes. Most of this volume, which is in the larger sizes, is concentrated in two very large plants. Necessarily, the plants are highly mechanized and conveyorized.

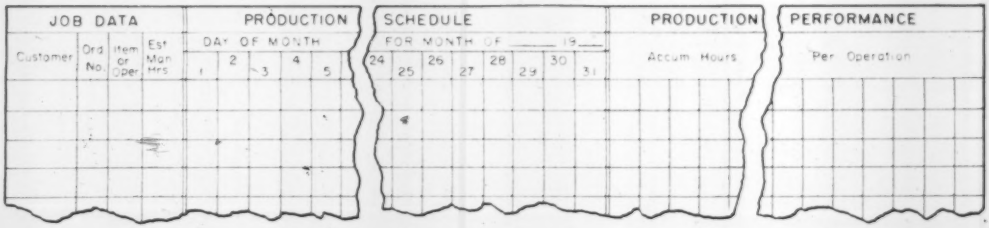
Solution of its production control problems was based on properly organizing the facilities for manufacturing, and on maximizing standardization of component parts. The production control operation is chiefly one of balancing the equipment loading and controlling the flow of material through purchasing and parts stores.

Equiment Line Flexible — To accommodate the variety of items in this mechanized, mass-production plant, equipment lines must be flexible and in some cases established on a standby basis. Consequently, as soon as an order is received the methods engineering department checks the operational sequences required to produce the order and arranges in conjunction with the production control department for the necessary changes in the parts production lines or for reactivating the standby lines. Sometimes this means moving machine tools in or out of the line, but as most of these lines are relatively short, and all machine tools are single-purpose, completely jigged and fixtured units, this merely becomes a large-scale setup.

The other important control requirement is on material. Like all automotive plants, there is very little, if any, space for storage of either raw or process material. This is particularly true of a nonstocking operation such as this one. This means that schedules for purchasing and receiving must be worked out precisely both as to time and quantity. For on conveyor lines there can be no "for want of a nail a shoe was lost-----" failures of supply. When a fully integrated production line grinds to a stop because of some missing part, the costs inevitably will mount fantastically.

The whole control effort in such a shop, after the order starts, is to keep materials coming in exactly as planned. There has never (*Please turn to Page* 104)

Typical planning sheet for job-order shop



Air Actuation Cuts Time In Manipulating Drilling Jig

By ROBERT MAWSON

PRODUCTION efficiency of a drill jig is determined by the percentage of nonproductive time to the total floor-to-floor time involved in its cycle of operation. The lower this percentage, the greater the efficiency of the jig.

In Fig. 1 are shown left and right hand parts called long links. These are made from steel forgings and are details used by the Dodge Mfg. Corp., Mishawaka, Ind., on one of its products. These forgings are first ground flat on both sides to a limit of plus or minus 0.002-inch. Second operation is the drilling of two 31/64-inch holes which later are reamed to 0.5020-0.5030-inch. The jig used for the drilling operation is illustrated in Fig. 2.

This drill jig is made with a solid machine steel base finished all over. On each side of the forward end of this base are mounted tool steel guide blocks. These blocks are fastened to the jig base, each with a socket head screw and two dowel pins. Machined to have good sliding fit between these guide blocks is a cyanided and hardened machine steel locating plate. Beveled work locating surfaces of this plate are machined to 15-degree angles. At the center of this plate is attached the piston rod of an air cylinder.

Screwed down and doweled to the jig base is a machine steel drill bushing plate. Accurately positioned in this plate are two drive fit tool steel, hardened and ground bushings. These are sized to guide 31/64-inch drills.

Beneath the bushing plate, and fastened to the base with the same screws and dowels as the plate, is a hardened machine steel stop plate. Like the work locating plate, this stop plate is also machined with a 15-degree edge. When the jig has been assembled four holes are drilled and tapped on its underside to suit the mounting positions on the drill press table.

To use the jig after it has been fastened in place on the table of the drill press, the air cylinder is first actuated to put the clamp into the nonmachining location—in other words it moves the sliding plate to the open position. A workpiece is then placed in the jig and air turned on to the cylinder to push the piston rod and the locating plate forward. This motion centers the workpiece by means of the angular surfaces on the plate. The piece is moved back against the plate and the 15-degree bevels on the two plates locate the part accurately and hold it securely.

Using a two spindle drill head the two holes are now drilled simultaneously, the drills, of course, being guided by the hardened bushings. To remove the finish drilled piece it is only necessary to activate the air cylinder to withdraw the locating plate to the open position so that piece can then be taken out of the jig. Thus the desirable low percentage of work-handling time in the floor-to-floor time is achieved.

Fig. 1 (below)—Specifications for machining right and left hand forged steel links, for which quick acting air-operated drill jig was designed

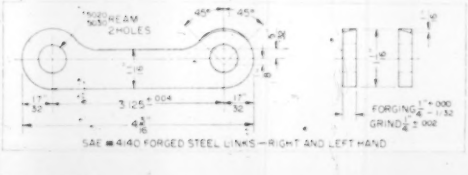
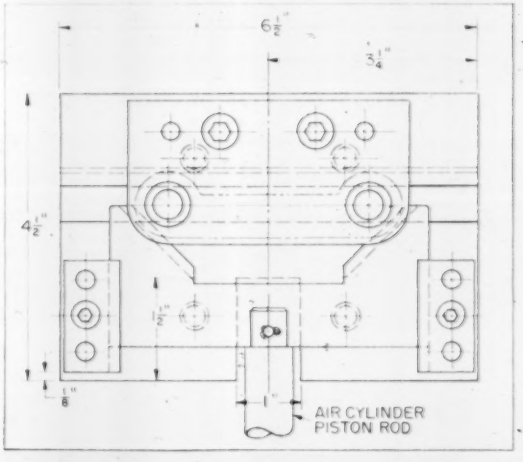


Fig. 2 (right)—Top view and end elevation of air-operated jig, showing how workpiece is clamped in place for drilling operation



BORON STEELS *in the Present*

Initial production heats of five new series of lean-alloy "needled" constructional steels show hardenability exceeding laboratory predictions, confirming experiences with thousands of tons of World War II analyses

THE PRESENT emergency has created a critical shortage of several alloying elements vital to industrial manufacture. Cobalt, columbium, tungsten, nickel and molybdenum are in the critical category at present, with the ever-present threat that chromium and manganese may eventually fall in the same category. Today, there is practically no cobalt, columbium or tungsten, and less than half enough nickel and molybdenum to produce steels containing these elements for other than military applications. The alloy shortage is worse now than in World War II because: (1) We were forced to make extravagant use of the highest grade ores during that emergency and are now mining lower grade deposits; (2) we are producing 30 per cent more steel in the United States; (3) military, naval and aircraft equipment today require richer alloys.

Potential Recognized—One ray of hope brightens this rather dim picture, at least insofar as heat treating steels are concerned. That is the potentialities of the element boron for increasing the hardenability of steel.

For the majority of applications for the constructional alloy steels, boron can probably replace a sizable quantity of nickel, chromium, molybdenum, and other critical alloys where their presence is necessary only for adequate hardenability.

The advantages in replacing other alloying elements with boron, aside from alloy conservation, are: (1) Improved hot and cold working, (2) shorter annealing cycle, and (3) improved machinability, all of which should result in economies. In replacing higher alloy contents in carburizing steels, boron contributes to simplified treatments by shortening the time cycle for annealing and minimizing retained austenite and undissolved carbides in the carburized case.

Although large-scale industrial use of boron in steel did not begin until the latter part of World War II, Guillet predicted in 1907 that boron steels might have industrial uses. It is also significant that Walter, in 1924, obtained a patent covering the use of boron to increase hardenability. However, the effect of boron on hardenability was not widely recognized until the early part of World War II when the correlation of hardenability with chemical composition became an invaluable tool in devising new types of alternate steels.

During the latter part of World War II, thousands of tons of boron steels were produced and used in military equipment, such as armor, projectiles, torsion springs for tanks, etc. Since 1945, there have been several large production applications of boron steels, such as large diesel locomotive crankshafts, heavy duty tractor axle shafts, wrenches and other hand tools, and cold headed bolts. In these applications, which require medium to high carbon steels,

Fig. 1—End quench hardenability—average heat 4340 vs 86B45 vs 8645

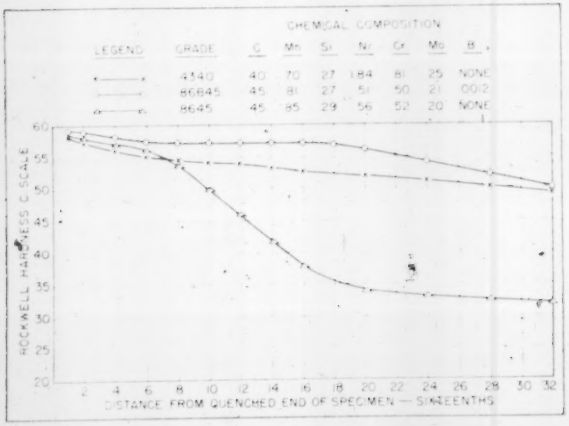
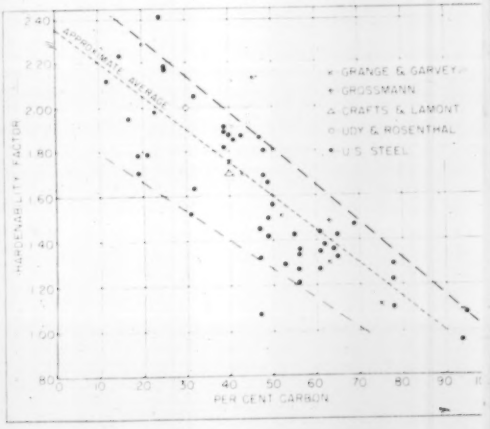


Fig. 2—Effect of carbon content on hardenability factor for boron based on ideal critical diameters derived from 50 per cent martensite critical hardness



Emergency

By P. R. WRAY
Metallurgical Engineer, Alloy Steels
United States Steel Co.

the boron alloy steel has replaced a higher alloy steel at a considerable saving not only in the cost of the steel but in fabrication, as will be shown later.

Hardenability Increased—The Metals Handbook of the American Society for Metals concisely describes the role of boron in steel: "Boron is used in steel for one purpose only—to increase the hardenability; that is, to increase the depth to which the steel will harden when quenched. Only a few thousandths of a per cent is ordinarily added." Boron can replace several hundred times its own weight of other hardening alloys, such as manganese, chromium, molybdenum and nickel. In one example, 0.001 per cent boron is contributing the same hardenability effect as 1.33 per cent nickel plus 0.31 per cent chromium plus 0.04 per cent molybdenum, or a total of 1.68 per cent of alloy. The effect of boron on hardenability decreases with increasing carbon.[1] Boron is more effective in the conservation of critical alloys in the lower carbon steels; consequently, the carburizing grades of alloy steel having less than 0.30 per cent carbon are more fertile fields than spring steels at 0.60 per cent carbon.

Isothermal Transformation Behavior — Isothermal transformation (IT) diagrams in the region of the "nose" are helpful in understanding the behavior of boron steels during conventional heat treatments, such as quenching, normalizing, annealing, etc. One illustration shows 1345 plus boron plotted on the same diagram as 4140. Notice that the time for beginning of transformation at the "nose" is approximately the same (reflecting equivalent hardenability), and yet the time for completion is much shorter for the 1345 plus boron. Completion time for 1345 plus boron is only slightly longer than for 1345 steel.

In this respect, boron as an alloying element is unique. It delays the start of transformation appreciably while delaying completion only slightly. This has a practical application in that a lower alloy steel containing boron can replace a higher alloy steel to obtain the same properties when hardened, yet the boron steel can be annealed with a much shorter cycle. Such steels are also softer than the higher alloy steel in the as-rolled or normalized condition, provided the size is sufficiently large that air quenching does not occur.

Effect on Ae_1, Ae_3 and M_s Temperatures—Boron apparently has little effect on the Ae_1, Ae_3, or M_s temperatures of the base composition. Table I shows Ae_1 and Ae_3 temperatures determined by the United States Steel Co. research laboratory for several carburizing steels. The M_s temperatures were calculated due to

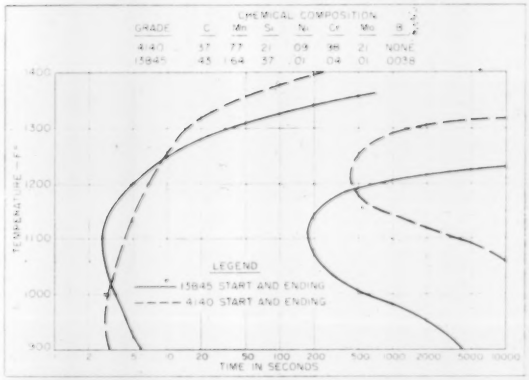


Fig. 3—Isothermal transformation in pearlite region—4140 vs 13B45

the difficulty of their determination in low carbon steels.

Boron tends to lower the austenite coarsening temperature of a steel; in some of the early work, this effect caused undue alarm. This tendency can be counteracted by a judicious increase in the aluminum addition used for grain size control.

Notch Toughness—The effect of boron on notch toughness is not clear at this date. Early work based upon comparison of the same composition with and without boron indicated that boron enhanced the notch toughness at high hardness levels (R 50 and above) and reduced the notch toughness at lower hardnesses. However, when a lower alloy composition containing boron is compared to a higher alloy steel, this effect of boron may be masked by the effect of other elements upon notch toughness. In any event, the notch toughness is adequate in all cases for most engineering applications.

Endurance limit and endurance ratio, as determined by laboratory and field testing, are the same for a given hardness as in other alloy steels heat treated to the same hardness.

Tempering Behavior—Boron in the amounts normally used does not increase the resistance to softening on tempering as do other alloying elements, particularly vanadium, molybdenum, or tungsten. When boron is used to replace these elements partially or completely to obtain equivalent hardenability, it is usually necessary to use a lower tempering temperature to obtain a given hardness and strength. Although it is possible to obtain an equivalent quenched hardness with a boron steel, it is wise to run pilot tests to determine the correct tempering temperature. The tensile strength will be the same at the same tempered hardness even though a different tempering temperature is used. Since boron apparently does not retard softening appreciably during the tempering treatment, it is anticipated that such steels would not be adequate replacement for higher alloy steels containing higher molybdenum.

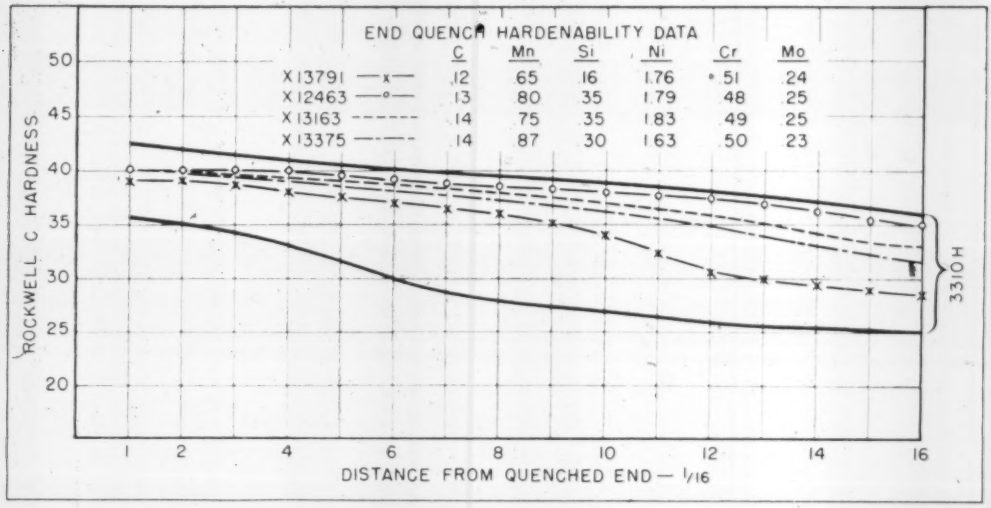


Fig. 4—Hardenability of a number of heats of Super-Kore A vs 3310

vanadium, or tungsten for high temperature service.

It is essential that the hardenability of the boron steel be sufficient to obtain martensite prior to tempering so that optimum properties can be developed at the location in the part where the highest stresses are encountered.

Hot and Cold Working, Annealing and Machining—There has been very little mention of the very desirable processing characteristics of boron steels such as forgeability and ease of cold heading, descaling, annealing and machining. Robbins and Lawless of Plomb Tool Co.[5] reported the data in Table II based on thousands of tons of 1045 plus boron steel made into the same parts (various types of wrenches) as were formerly made from 9445 steel.

The 1045 plus boron steel had a lighter and less adherent scale, which was easier to remove than the scale on the 9445 steel and required 30 per cent less pickling. The above performance is probably the result of the lower total alloy content of the 1045 plus boron. Other shops concur that the boron steel behaves the same as the base composition without boron, (i.e., 1045 plus boron similar to 1045).

It was pointed out earlier than boron alloy steels should be easier to anneal than the higher alloy steels they replace, because the boron steels have about the same annealing characteristics as the base composition to which boron was added. Robbins and Lawless reported that they had been able to cut their annealing time and costs in half by changing to the boron steel. They also reported improved machinability due to obtaining a more desirable structure in the boron steel.

Properties in Carburizing—During the last few years, some interesting research and development work has been done on the carburizing steels. This work was undertaken to find a steel with hardenability comparable to 3310 and 9310 steels which would minimize undesirable characteristics, such as retained austenite and undissolved carbides after carburizing and hardening, necessitating expensive treatments.

United States Steel Co. developed a steel known by the trade name USS SuperKore A, which is essen-

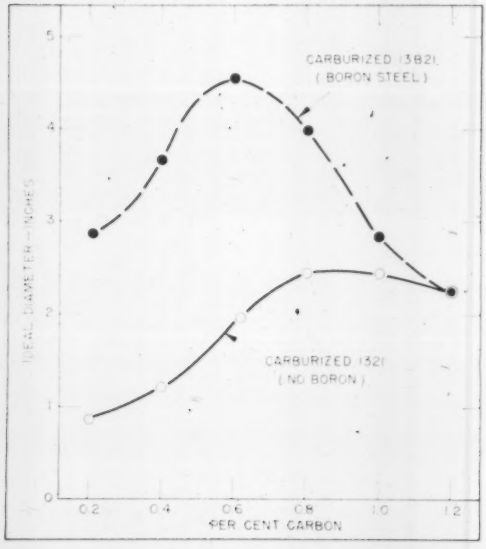


Fig. 5—Hardenability effect of boron decreases with increasing carbon content. This is shown graphically in a high manganese carburizing steel (1321) with and without boron

tially a 4312 plus boron and 0.03/0.07 per cent vanadium. The new steel, having about 2½ per cent total alloy content, has been thoroughly tested by Pratt & Whitney Division of United Aircraft Corp. for heavy duty gears, shafts, and pinions in their large air-cooled engines, and is approved for aircraft use under AMS Spec. 6266. Pratt & Whitney reported improved carburizing characteristics—much less retained austenite and undissolved carbides on direct quenching.

U. S. Steel has extended this development to steels of lower alloy contents, such as SuperKore B (4615 plus boron) and SuperKore C (8615 plus boron) with results comparable to those reported above. Work on these carburizing steels over the last four years has shown that lower alloy steels containing boron will have the same core properties as the higher alloy steel they match in hardenability, and at the same time the boron steels are easier to forge, anneal, machine, and to heat treat after carburizing because of their lower total alloy content.

Hardenability of the Carburized Case—It was shown earlier that the hardenability effect of boron decreases with increasing carbon content. This is shown graphically in a high manganese carburizing steel (1321) with and without boron, Fig. 5. This means that although the core hardenability of the 1321 plus boron steel is similar to a higher alloy steel, (in this case greater than 3316) the case from 1 per cent carbon and higher has the hardenability of 1321, and might induce soft spots in heavy sections or in smaller sections where fixture quenching is employed to control distortion. Whether this will be a serious shortcoming can only be determined on production parts. One method for minimizing this behavior is to limit the carbon in the case to a predetermined maximum. (Recent work indicates that in some steels, a limit of 0.90 per cent will suffice.)

The possible reward from limiting the maximum carbon content of the case is quite promising. At least one manufacturer of large trucks is now using this technique with boron steel successfully, although arriving at the remedy for different reasons.

Apparent Loss in Core Hardenability on Direct Quenching Following Carburizing — Concerning this problem, Grange & Garvey first reported in 1946[6] that heating to high temperatures sometimes resulted in a partial or complete loss of the hardenability effect of boron. Grange has also found this apparent loss in hardenability in boron carburizing steels after long-time heating at carburizing temperatures followed by direct quenching. Fig. 6 shows a series of hardenability curves of 8620 containing boron. Samples were pseudo-carburized (heated in vacuum) for 17 hours at the temperatures indicated and quenched. Notice that the higher the temperature, the lower is the hardenability.

In Fig. 7, the curve for the sample pseudo-carburized at 1750° F is replotted along with one obtained by the normal treatment of 20 minutes at 1700° F, followed by quenching, as well as a third curve obtained by pseudo-carburizing 17 hours at 1750° F, slow cooling to 1550° F (equalizing at 1550° F), followed by quenching. Notice that

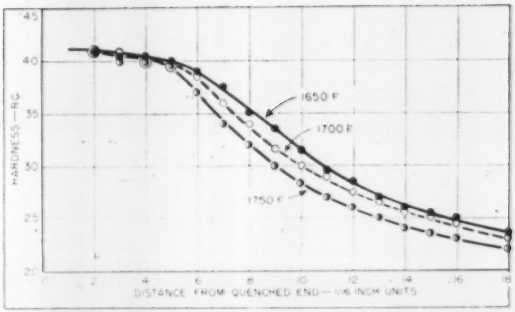


Fig. 6—Effect of pseudo-carburizing for 17 hours at each indicated temperature upon hardenability of an 86B20 steel

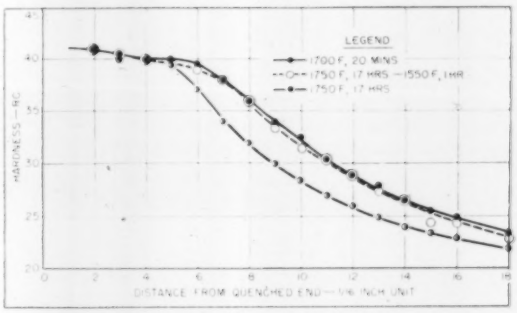


Fig. 7—End quench hardenability tests 86B20. C—0.18, Mn—0.83, Ni—0.49, Cr—0.49, Mo—0.19, B—0.0013

the loss in hardenability encountered in the direct quenching from the carburizing temperature is recovered by slow cooling to 1550° F prior to quenching.

It is anticipated that production results will confirm the beneficial effect of this treatment; in fact, this treatment will also be beneficial to the control of distortion. Another sample was pseudo-carburized for 17 hours at 1750° F, slow cooled to room temperature, reheated to 1550° F and quenched. Since this sample developed the full hardenability of the 20 minutes at 1700° F cycle, it was not plotted in Fig. 7. The mechanism of this phenomenon of hardenability changes is still a matter of conjecture among metallurgists.

New Boron Constructional Alloy Steels—Because of the necessity for conserving the critical alloying elements, nickel, chromium, and molybdenum, the American Iron & Steel Institute, on February 12, 1951, announced two new series of steels designed to accomplish this purpose (see STEEL Feb. 19, p. 38; Mar. 5, p.57; Mar 12, p.116). These steels known as 80Bxx and 81Bxx are low nickel, chromium, molybdenum compositions containing boron, in which the boron has replaced about half of the critical alloy content of the 8600-8700 steels which were the basic National Emergency steels of World War II that have

TABLE I
EFFECT OF BORON ON THE A_{c_1}, A_{c_3} AND M_s TEMPERATURES

(°F.)

Grade	A_{c_1}	A_{c_3}	M_s (Calculated)
4317	1270	1485	740
43B17	1270	1485	740
3615	1250	1465	775
36B15	1250	1470	770
8620	1320	1530	760
86B20	1320	1505	760

TABLE II
FORGING 9445 VS. 1045 PLUS BORON

	9445	1045 plus Boron
Forging Parts per die sinking	13,000-15,000	22,000-25,000

Estimated the 1045 plus boron resulted in a 25% increase in die life

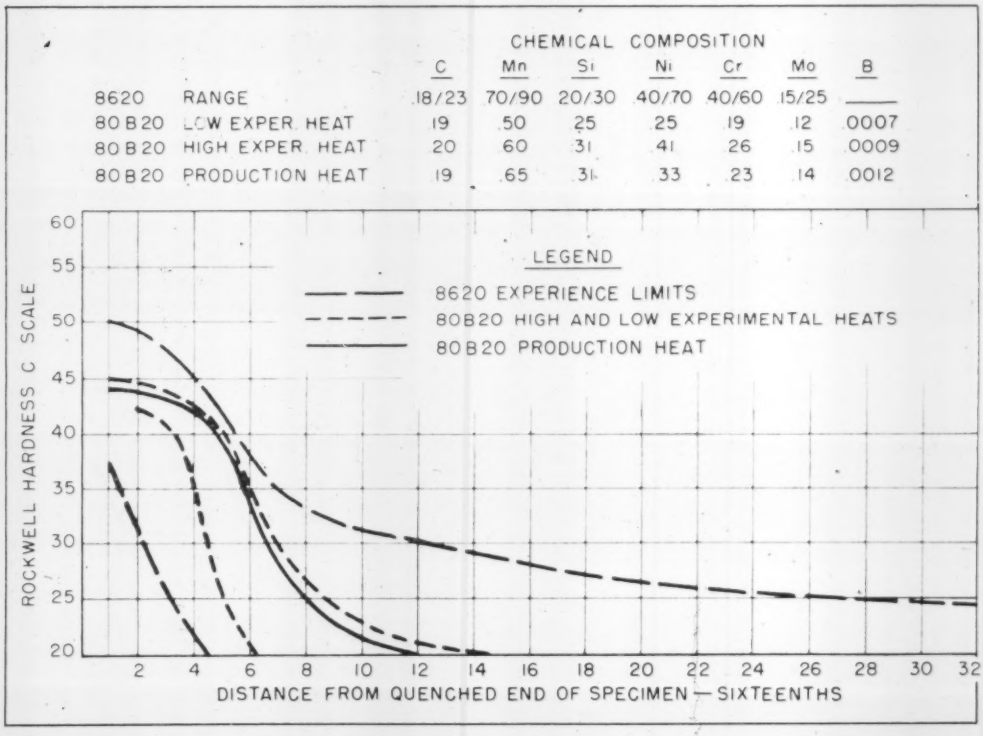
since taken their place in the mass production industries of the United States.

The 80Bxx steels will match the hardenability of the 86xx-87xx and the 81Bxx will match the 41xx types and, consequently, should be able to replace 70 to 80 per cent of the present constructional alloy steels on an equivalent hardenbility basis. It is still too early to state whether the composition of these steels will have to be altered slightly, based upon production experience, since only a handful of production heats have been made. So far, the hardenability of the production heats seems to be exceeding the limits predicted from laboratory data.

In addition to the 80Bxx and 81Bxx series, three additional boron steel types are showing promise at this early date. These are the 94B17 and 94B20 for carburized parts formerly made of 4620, the 43B17 as a replacement for 4820 in carburized parts of heavy duty trucks and 86B45 as a replacement for 4340.

The Society of Automotive Engineers has established Division VIII of its Iron & Steel Technical Committee to collect and disseminate the experience gained in the production, fabrication, testing and use of these new steels. Roster of this committee includes representatives of the steel, automotive, tractor, truck, oil well drilling, machine tool and aircraft industries, as well as the military services. It is anticipated that from this committee will come a vast amount of data which will aid American industry in the campaign to stretch available alloys to the utmost.

Fig. 8—End quench hardenability, 80B20 vs 8620


CHEMICAL COMPOSITION
C Mn Si Ni Cr Mo B
8620 RANGE .18/23 70/90 20/30 40/70 40/60 15/25 ——
80B20 LOW EXPER. HEAT 19 .50 25 .25 19 .12 .0007
80B20 HIGH EXPER. HEAT 20 60 31 41 26 .15 .0009
80B20 PRODUCTION HEAT 19 .65 .31 .33 .23 .14 .0012
LEGEND
8620 EXPERIENCE LIMITS
80B20 HIGH AND LOW EXPERIMENTAL HEATS
80B20 PRODUCTION HEAT
ROCKWELL HARDNESS C SCALE
60 55 50 45 40 35 30 25 20
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
DISTANCE FROM QUENCHED END OF SPECIMEN—SIXTEENTHS

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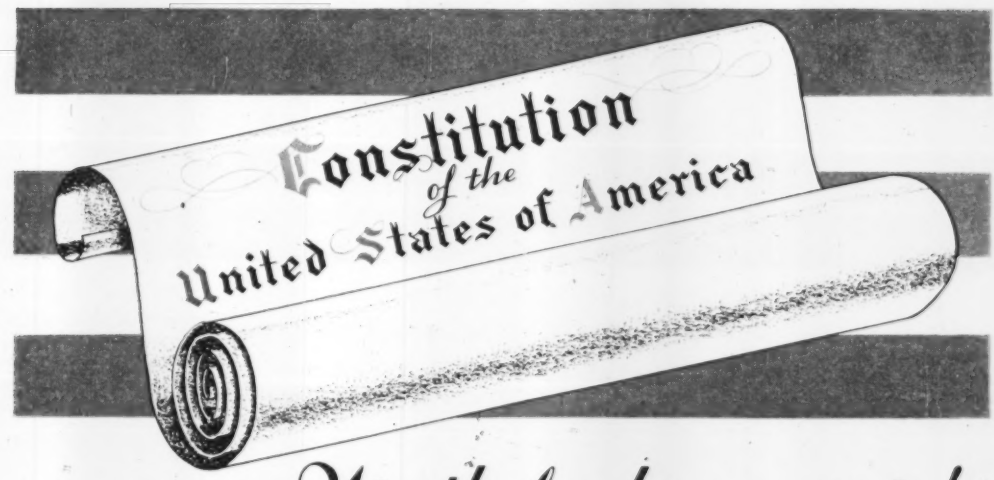
Also see STEEL, June 6, 1949, p. 105.

ACKNOWLEDGMENT

The author is indebted to his associates on the Technical Committee of Alloy Steel Bars of the American Iron & Steel Institute and the Iron & Steel Technical Committee of the Society of Automotive Engineers, wherein much of this work is being planned and developed, and to R. A. Grange and J. F. Boyce of the United States Steel Co. Research Laboratory for their many valuable contributions to data.



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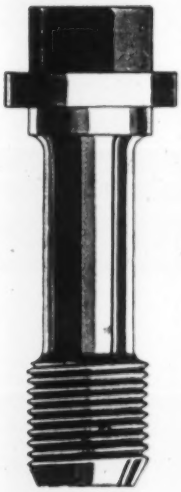

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Demand for High-Quality Coal Taxes Mechanical Cleaning Units

By JOHN GRIFFEN
Consulting Engineer
McNally Pittsburgh Mfg. Corp.
Pittsburgh

Trend in bituminous field indicates development in this country of new cleaning equipment capable of handling coal larger than ¼-inch and separating it more precisely and at lower densities than heretofore

PRESENT trends in bituminous coal cleaning are dictated primarily by the economics resulting from increasingly high wage rates in the industry and the fact that much of the highest quality bituminous coal has already been mined.

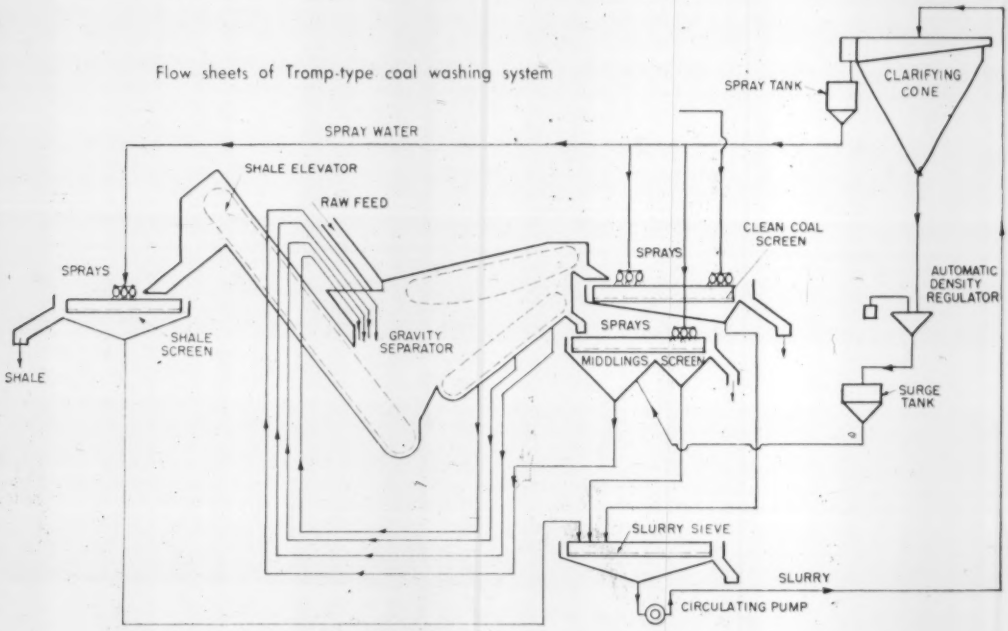
Impact of high wage rates has been greatest on underground costs and has caused development of mechanical mining methods to offset the effects of ever increasing wage rates. Use of machines to load the run-of-mine coal underground has made it more difficult to eliminate at the face extraneous impurities. Experience seems to indicate that the cheapest mining costs with mechanical loading can often be obtained by breaking down, with the seam, strata of refuse of considerable thickness, found in the roof as middle binder or even in the bottom.

These new mining methods, in addition to adding heavy refuse materials which can be relatively easily cleaned from the coal, also add materials of only slightly higher specific gravity than the coal and thus pose much more difficult mechanical cleaning problems. In these cases well-known mechanical cleaning units, such as jigs, Rheolaveurs, etc., may not be able to produce clean coal of acceptable quality except with losses of coal which are uneconomical.

Hand-Picking Boosts Labor Costs—A further effect of high wage rates is evident in cleaning larger sizes of run-of-mine output as labor costs for the removal of large refuse by hand-picking are often excessive. Mechanical loading underground tends to pyramid hand-picking costs since increased refuse content of run-of-mine is largely concentrated in the larger sizes. In a number of coal fields run-of-mine is crushed to a size where mechanical cleaning can handle the entire output.

Where the refuse is more resistant to breaking than coal, use of rotary breakers is advantageous. These units consist of a heavy trommel-type screen equipped with lifting plates and anvils. Run-of-mine material, small enough to pass the screen opening, is quickly passed through while the larger material is lifted and dropped on the anvils. The coal breaks until it passes the screen while much of the refuse is not broken and is discharged from the trommel's lower end.

Flow sheets of Tromp-type coal washing system



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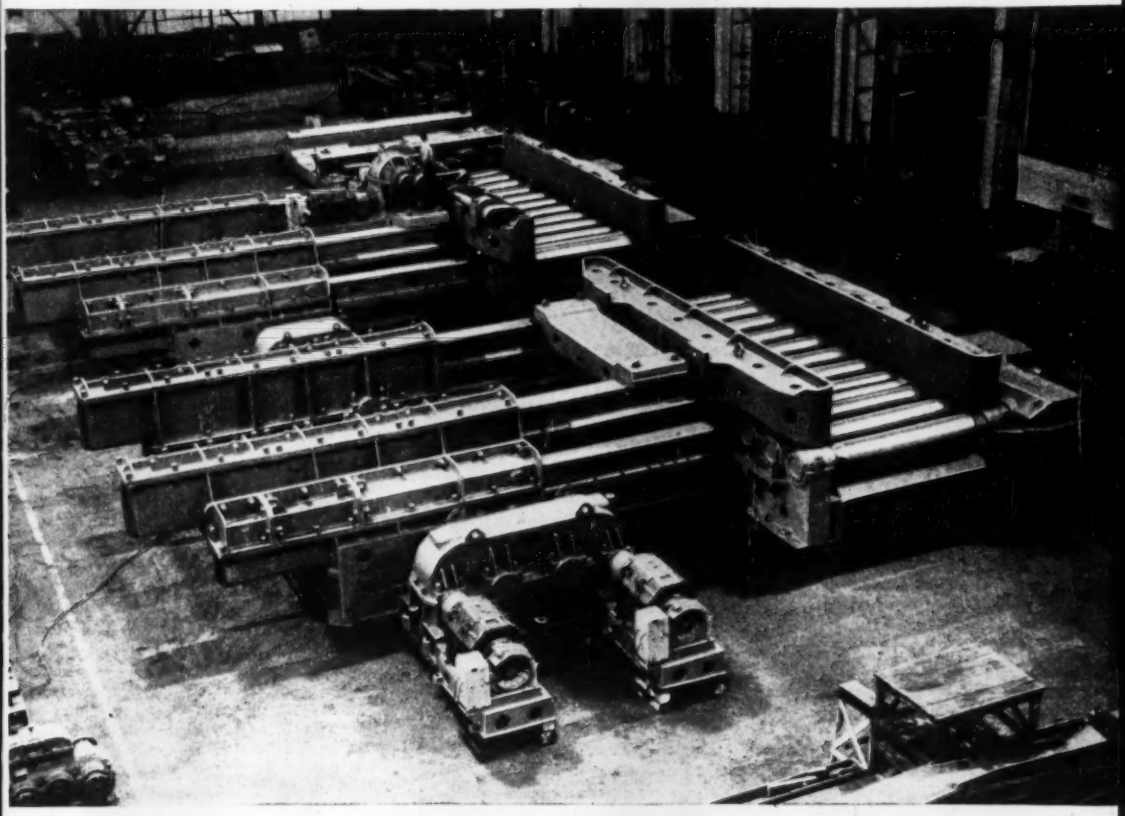

Shop view of 40" Blooming Mill Manipulator and Mill Tables, furnished with a Morgan 40" Blooming Mill, having Twin Motor Drive. Manipulator is of the overhead type, electrically driven with retractable heads so the table rollers can be removed without dismantling the manipulator heads.

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Experience with the new continuous mining machines, where one unit breaks the coal at the face and loads it on to the transportation means, is not yet extensive enough to establish its effects on coal cleaning. Indications are that little coal above 6 or 8 inches will be produced and that more minus ¼-inch and other extreme fines will be made. Thus, cleaning of fine coal may become more important.

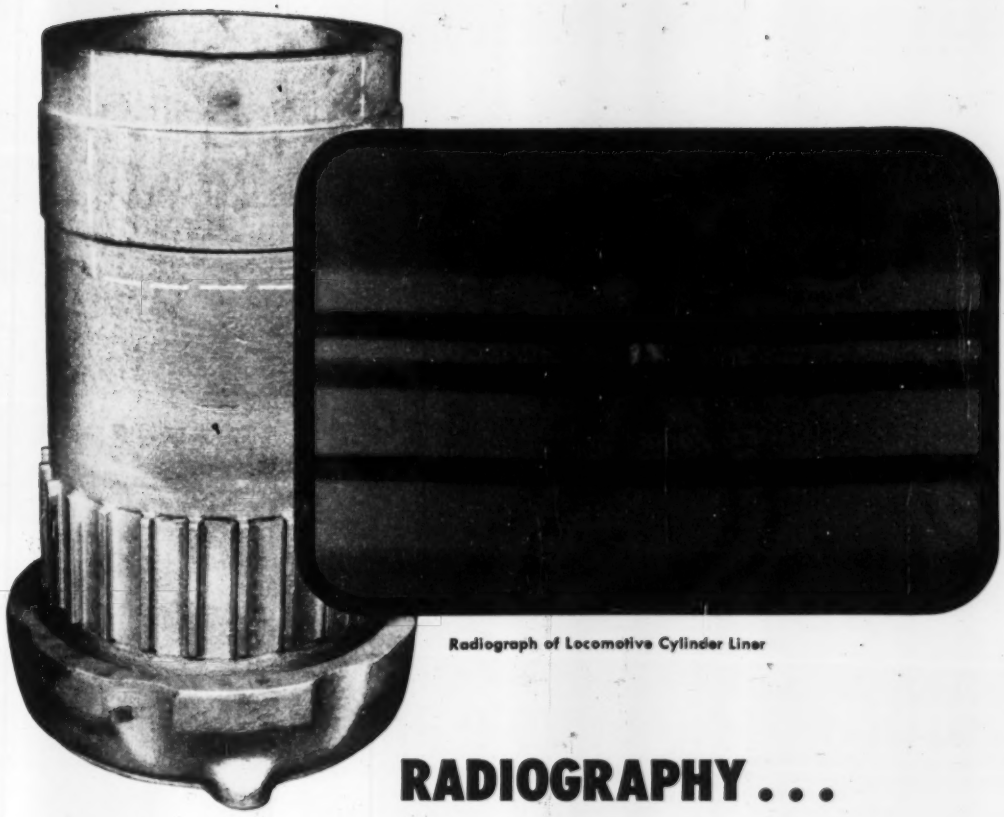
It further appears that, in many cases, run-of-mine output may contain less refuse than with mechanical loading, as it may be possible to leave unmined top and bottom strata which must be removed with the latter system of loading.

Mechanical Cleaning Still Economical Indications, today, are that the mechanical coal cleaning equipment in use in this country over the past 20 years can still handle most economically a large proportion of our output and produce coal of a quality acceptable to most markets. Baum-type jigs, Rheolaveurs and hydraulic classifier types of equipment are successfully cleaning coal up to 6-inch size and in some cases as coarse as 8 inches. Water is still the most economical medium for separating impurities from raw coal because equipment required to recover and recirculate it is cheaper in both first and operating costs.

Only where coal of suitable quality cannot be recovered with a high efficiency of separation are the newer processes of the heavy media-type justified, for today their investment and operating costs are somewhat higher. As experience is gained with the heavy media processes and equipment, development should enable a reduction in their costs.

Newer heavy media processes utilize finely divided solids held in suspension in water. The medium solids must be of sufficiently high specific gravity usually above 2.60 to impart proper density to the mixture of water and solids or medium. Density of the medium is seldom less than 1.35 specific gravity ranging upward to as high as 2.00 specific gravity.

Type of Media Media are of two general types designated as stable and unstable. With the former the solids are usually so fine that there is little if any settlement of the solids when the medium is quiescent. Unstable media require agitation or currents to keep the solids in suspension, or to so control their settlement as to facilitate the desired separation of coal and impurities. Because of the problems involved due to contamination of the medium solids by fine coal particles, most heavy media processes are limited to treating coal



Radiograph of Locomotive Cylinder Liner

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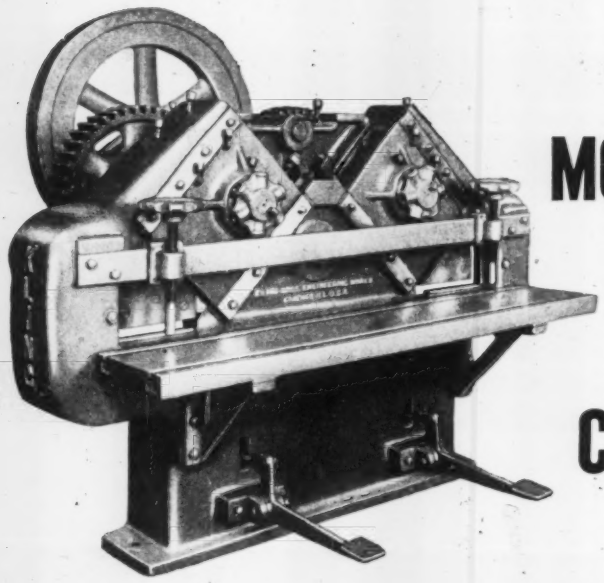

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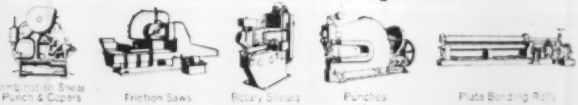

larger than ¼-inch, although in some cases, slightly finer coal has been treated.

Tromp Process Described—A heavy medium process developed in Holland and now being introduced into the United States by McNally Pittsburg Mfg. Corp. is the Tromp process. It utilizes magnetite or other heavy iron-bearing materials such as spathic iron ore, mill scale, etc., but does not depend on the magnetic properties of medium solids for their recovery. As generally practiced, gravity methods of medium recovery and cleaning are used and have proved satisfactory.

Much coarser magnetite is used, being usually only minus 80 mesh, and produces a partly unstable medium, but the separating vessel is designed to take advantage of this condition and it facilitates recovery and cleaning of the magnetite by differential settlement. Settling rate of the coarser magnetite is so rapid that the fine contaminating solids can be made to overflow a settling cone while the magnetite settles and is recovered for reuse.

Tromp vessels are built to separate into two products — coal and refuse, and also to separate into three products—coal, middlings or bone and refuse.

Conveyor Has Pervious Bottom — Flow sheet of a Tromp 3-product installation, is shown in drawing. The 3-product vessel is fairly deep and, with the coarser magnetite, settlement takes place so that the medium's specific gravity is progressively greater with depth. Advantage is taken of this to effect a separation of the lighter coal, carried by the top layer of medium to the top conveyor which drains the coal of medium and elevates it from the vessel. Both middlings and pure refuse sink through this top layer. Middlings are supported by middle layers of higher density medium which flow towards the lower middlings conveyor. This conveyor is provided with a pervious bottom, allowing the middle layers of medium to flow out of the vessel for continuous return as transporting currents.

Pure refuse sinks through to the bottom and is removed by a drainage elevator. Desired density in the various strata in the bath is definitely controlled to desired values by the continuous circulation of three or four circuits of the desired densities which are returned to the vessel at appropriately varying depths.

As shown in drawing, coal and refuse products are discharged, drained free of medium, to rinsing screens of about 2 mm opening where adhering medium is removed by water sprays.

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Here's PREPAREDNESS of the Soundest Kind

3 Brown & Sharpe Machines

that equip you to mill small and medium-sized parts fast, accurately, economically

The greatest service you can render to your company today, is to make sure that your plant facilities are prepared to meet increasing demands for accurately-made small and medium-sized parts at low cost.

That is why it will pay you to investigate the three manufacturing-type Brown & Sharpe Milling Machines shown here. They are specifically designed for mass producing milled parts, with uniformly high precision and minimum demand on the operator's time and attention. Adapted to an almost endless variety of jobs, they assure you continuing big returns on a moderate capital investment. Write for detailed catalog and specifications. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

No. 12 PLAIN MILLING MACHINE
3 h.p. Spindle Drive

Complete electrical control of all power movements gives unusually precise, smooth performance with outstanding ease and flexibility of operation. Wide variety of automatic cycles obtainable, with time-saving dual feed rate. Ample capacity for the majority of medium-sized work. Climb milling in either direction permitted by built-in backlash eliminator.

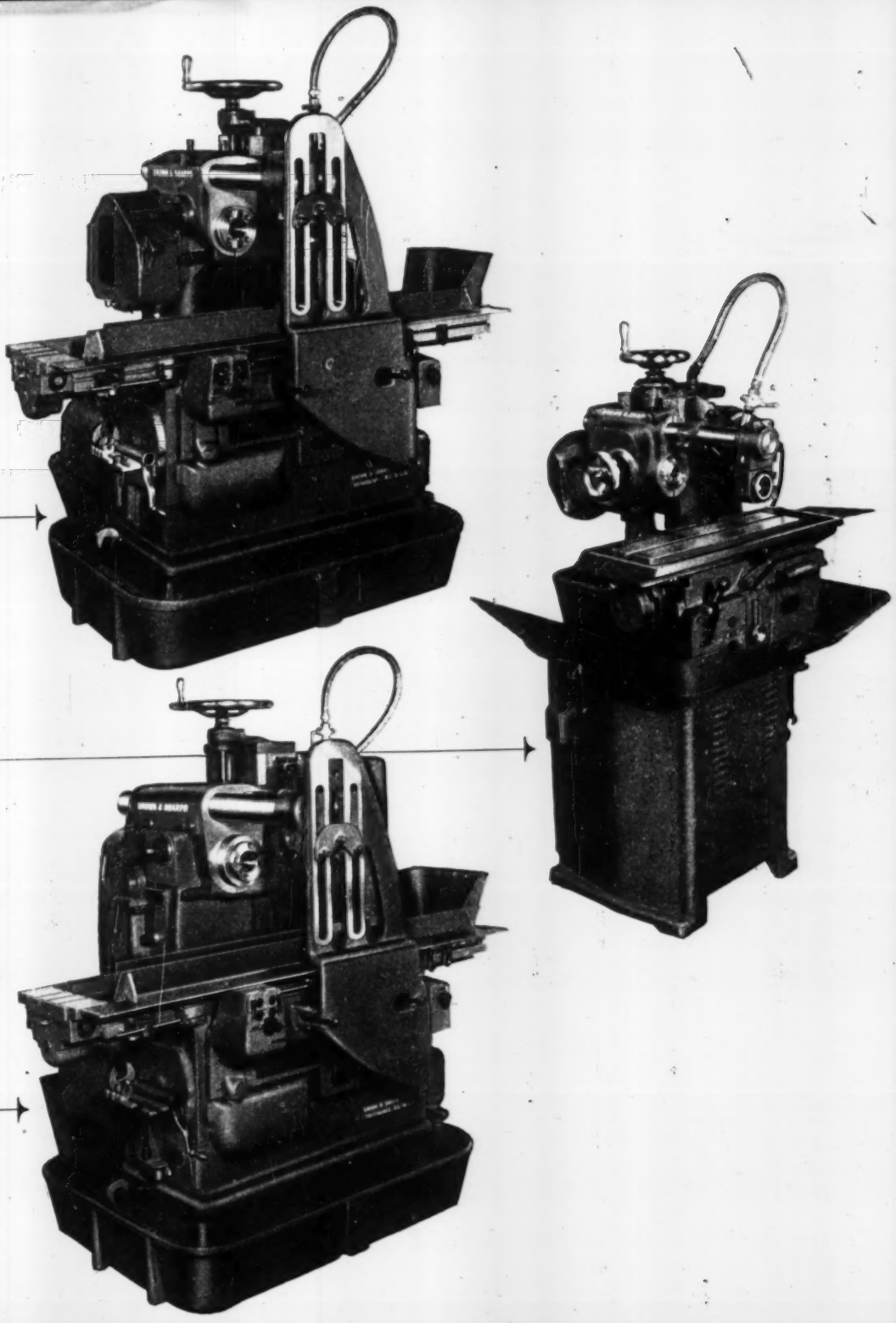
No. 000 PLAIN MILLING MACHINE
½ h.p. Spindle Drive

For economical, fast production of small pieces such as parts for firearms, sewing machines, radios, etc. Automatic cycle and minimum fatigue for operator afford uniform rate of production. Uniform, positive feed gives long cutter life.

No. 12 PLAIN MILLING MACHINE
7½ h.p. Spindle Drive

Same features and advantages as the 3 h.p. model, but powered for heavier cuts, including many moderate-sized carbide milling jobs.

Brown & Sharpe B·S



Tiny holes? . . . . . Easy!

Accurate holes? . . . . . Easy!

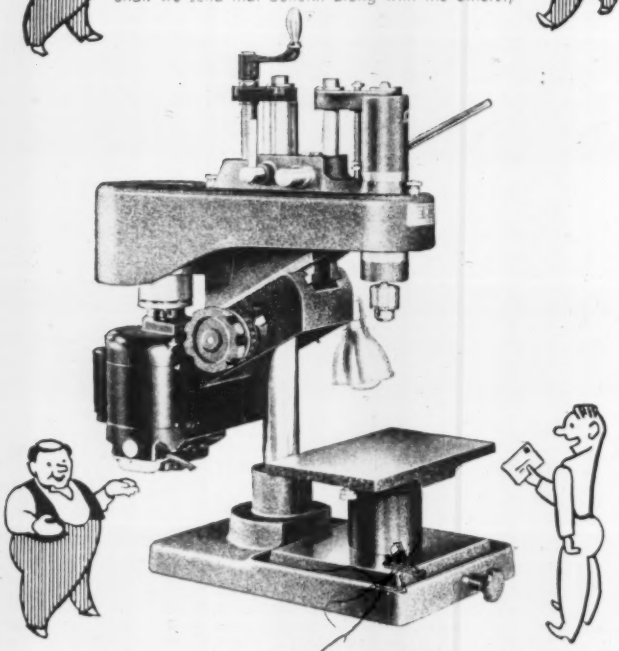
Holes on production schedules? . . . . . Easy!

Tiny, accurate holes on *production schedules?* . . . WOW!

Hamilton Drilling Machines can do it! And withdraw the drill undamaged from hole after hole after hole!

LEARN HOW!

Write for the series of Hamilton Drilling Machine Bulletins and Price Lists. (There is also a companion Tapping Machine. Shall we send that bulletin along with the others?)



Shown here is the Hamilton Varimatic, Super Sensitive, Variable Speed, Small Hole Drilling Machine, one of four models, each particularly adapted to the work for which intended, all equally precise.

THE Hamilton TOOL COMPANY

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Middlings as discharged carry considerable medium which is drained on the first section of a screen and the second section provides for rinsing. Rinsings from the three screens are combined and pass to a slurry screen, making about an 80-mesh separation, where the magnetite and water pass through and any plus 80-mesh contaminating solids are removed and delivered to the plant's fine coal cleaning section.

Density Automatically Controlled— Dilute medium from the slurry screen is delivered to a settling cone, where the magnetite settles to a high density pulp while excess water, carrying any minus 80-mesh contaminating solids, overflows. This overflow water is used as initial sprays on the rinsing screens. Final sprays are clear water, so there is a constant small excess overflow from the settling cone which purges the medium of minus 80-mesh contamination from the raw coal. Density of the discharge of recovered medium is automatically controlled by a density regulator.

That Tromp automatic density regulators give precise control of specific gravity of the bath in the separating vessel is vouched for by careful tests which shows the following:

	Specific Gravity
Average density	1.5358
Average deviation	± 0.0014
	= 0.0008
Probable variation	0.0009

These results indicate a maximum

Hook Makes Loadings Easy

TANKS are loaded into cars for shipment by Columbian Steel Tank Co., Kansas City, Mo., by using a special hairpin-type hook with a lifting crane. The hook slips into the filler holes of tanks and is offset so tanks are balanced properly for easy handling and stacking

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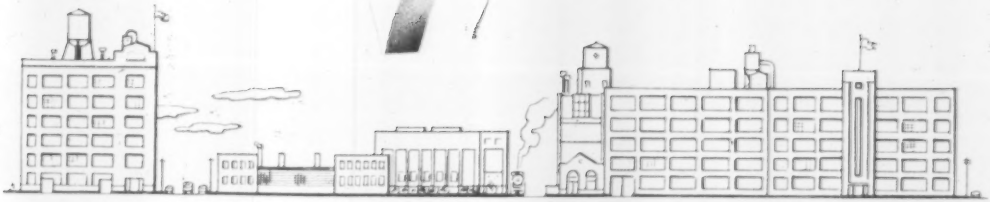

★ For three-quarters of a century this familiar trade mark has been a symbol of *quality* and *dependability*. It has been an unfailing guide to the finest tools that skill and experience can produce—Twist Drills, Reamers, End Mills, Screw Extractors, Arbors, Mandrels, Counterbores, MO-MAX High Speed Ground Tool Bits and Cut-off Blades. ◈ The demand for these tools has increased steadily throughout the years, requiring a continuous expansion of our manufacturing facilities. Today we have a total of ten acres of floor space.

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Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los-Angeles 58

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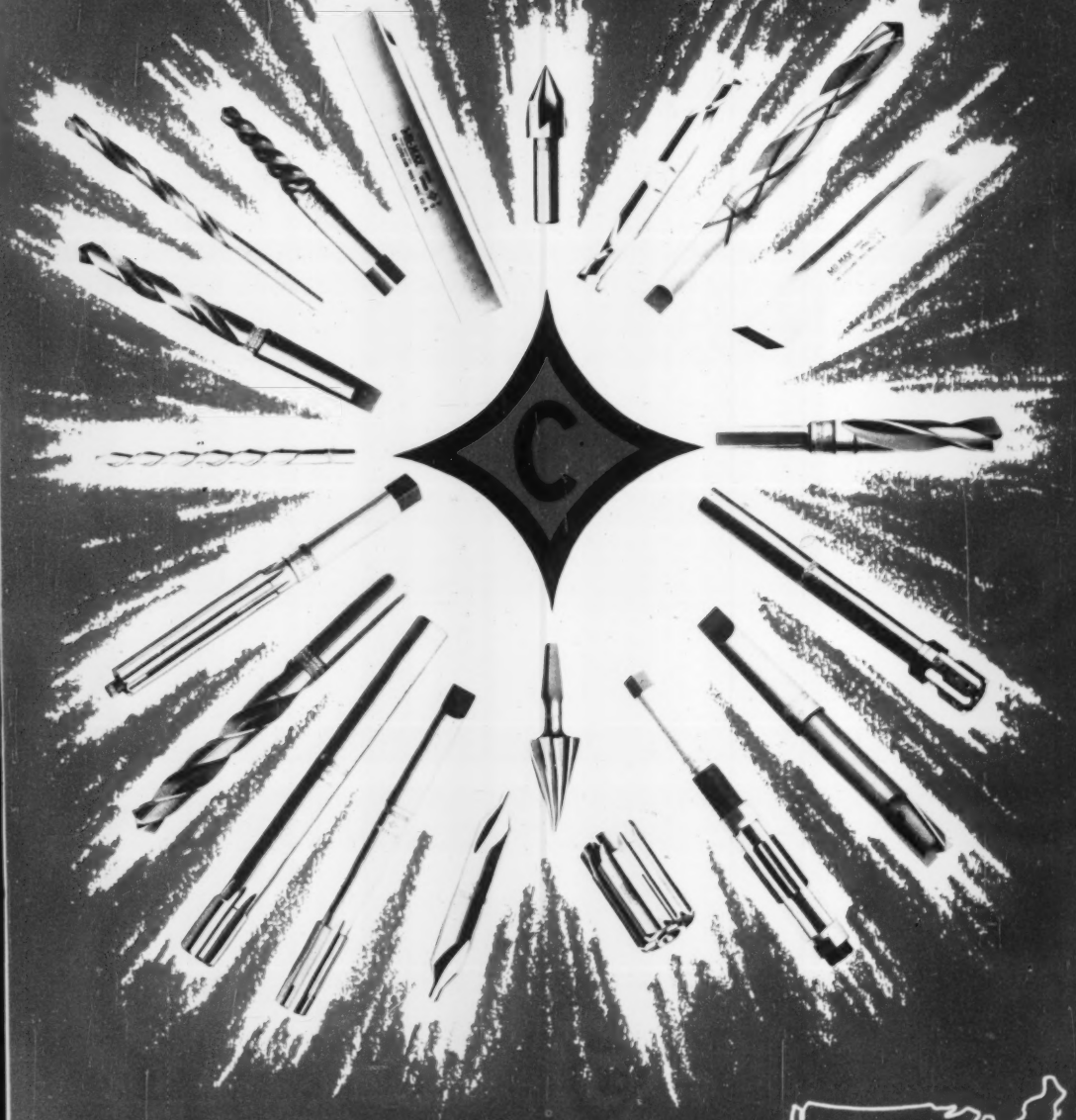
ARBORS • MANDRELS • COUNTERBORES • CARBIDE TIPPED TOOLS
MO-MAX HIGH SPEED GROUND TOOL BITS AND CUT-OFF BLADES



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density variation range of about 0.003 sp gr in the separation between clean coal and middlings. With medium of lower density the variation would be correspondingly reduced. Automatic density regulators, which largely eliminate operator attention, are valuable in maintaining continuously sharp separations at the desired density.

French Cleaning Installation—Test results depicting sharpness of the separations effected are supplied by the French Coal Administration. An installation in the nortn of France is cleaning a 2 to ½-inch coal, separating clean coal at 1.747 sp gr, while a middlings product is separated from the refuse at 2.012 sp gr. The weight recovery of the products was:

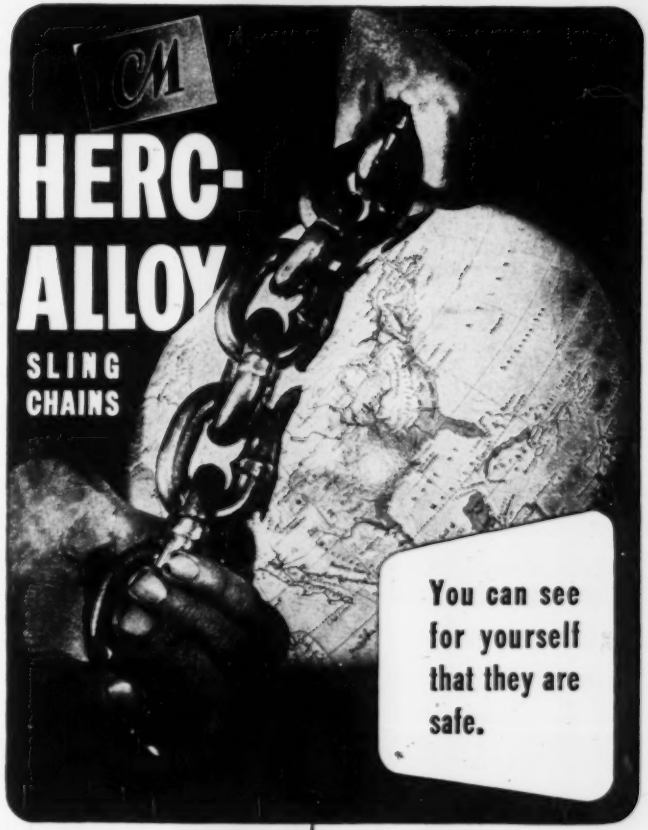
	Per Cent
Clean coal	59.56
Middlings	4.02
Refuse	36.42

The clean coal product contained 0.10 per cent sink while the middlings contained 2.0 per cent float at 1.747 sp gr and the refuse no float at this density. Total misplaced material is only 17.5 per cent of the plus or minus 0.02 sp gr material.

If this coal were cleaned by a jig or other conventional equipment at this separating gravity, the misplaced material would total about 2.0 per cent of the feed instead of only 0.14 per cent. This means that the ash content of the clean coal would be increased by at least 0.5 per cent or, should the same ash content of clean coal be required, the conventional equipment would have to make a separation at a lower gravity with a loss of several per cent in recovery.

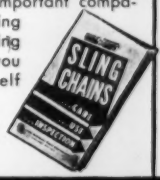
That the Tromp process is also highly efficient when separating at low densities, is shown by a test on 3½ to ⅞-inch foreign coal which was separated in a 3-product bath at 1.352 sp gr and middlings and refuse separated at about 1.85 sp gr. Separation between coal and middlings at 1.352 sp gr had total misplaced material which amounted to only 6 per cent of the material in the feed plus or minus 0.02 sp gr of the separating density

Tromp Two-Product Vessel—This vessel which is used to separate the feed into two-products only, coal and refuse, is shallow. Float coal is removed by a flight conveyor, which also acts to drain the medium from the coal, so that only rinsing is done on the coal screen. Refuse is removed by the lower flight conveyor accompanied by a stream of medium, which is drained on the first section of the refuse screen followed by rinsing with water sprays. Recirculated medium is introduced back of the feed point and provides horizontal currents to



● Just one of the big advantages of HERC-ALLOY Sling Chains is that you can determine their serviceability by a simple visual inspection.* Ordinary steel or iron chains, on the contrary, grow dangerously brittle with age... an insidious threat to the safety of men and materials. That's why more and more of the important companies are standardizing on HERC-ALLOY Sling Chains... because you can see for yourself that they're safe.

*Write for your copy of this new, informative booklet. No charge.



HERC-ALLOY FEATURES

- America's first alloy steel sling chain... first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout... links, rings, hooks. There is only one grade... the best.
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- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should never be annealed.
- HERC-ALLOY Chains are lighter... stronger... easier to handle... outlast ordinary chains 4 to 5 times... cost less on the job.

HERC-ALLOY... the chain you can SEE is safe

COLUMBUS-McKINNON
CHAIN CORPORATION
Affiliated with Chisholm-Moore Hoist Corporation
GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
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They knew *something was in the air!*

When Ford pried the lid off this box, a revolutionary new way to pack auto parts came to light. Custom was to spray bare metal surfaces with grease or oil. Then, before parts were usable, they had to have a "hot bath." But after 3 months of open storage with only Angier VPI* Wrap to line this box, the floor pans came out shiny and clean. "No evidence of rust" said Ford's Export Division.

Because VPI takes the rust-making power out of air and moisture, you *know* when this invisible vapor is in the air. Today 8 big names in the automobile world are saving priceless man-hours and valuable floor space with Angier VPI Wrap. It stands to reason that this *proven* vapor method can stop rust for *you!* Write: Angier Corporation, Framingham 8, Mass.

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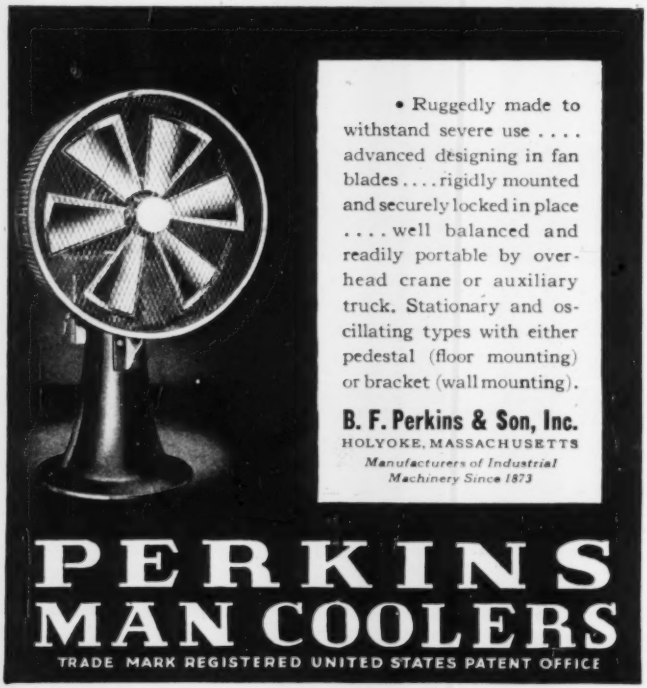


• Ruggedly made to withstand severe use .... advanced designing in fan blades .... rigidly mounted and securely locked in place .... well balanced and readily portable by overhead crane or auxiliary truck. Stationary and oscillating types with either pedestal (floor mounting) or bracket (wall mounting).

B. F. Perkins & Son, Inc.
HOLYOKE, MASSACHUSETTS
Manufacturers of Industrial Machinery Since 1873

PERKINS MAN COOLERS

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

float the coal into the coal conveyor. These currents continue to and overflow at the refuse discharge point. The medium recovery circuit with the automatic density controls is substantially the same as for the 3-product vessel.

Early in 1950 a total of 37 Tromp vessels had been installed in 21 European coal cleaning plants with a total capacity of 2800 net tons per hour input. These vessels are cleaning a wide variety of size ranges. Largest coal handled is 12-inch top size and the finest material is 1/5-inch bottom size.

First Tromp installation in this country is now being made in Illinois at a new property being developed in the No. 6 seam. The preparation plant has an input capacity of 800 net tons per hour of run-of-mine crushed minus $6\frac{1}{2}$-inches. A second installation is being made at an eastern Kentucky property to clean plus $\frac{1}{4}$-inch Pond Creek seam coal at a fairly low density to produce a high-quality coking coal.

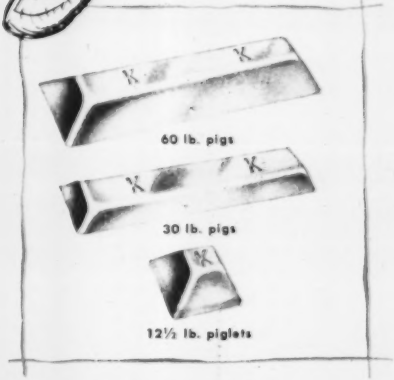
Heavy Medium Process Advantages—In connection with existing washeries, the heavy medium processes afford an opportunity to improve both coal quality and recovery while utilizing existing cleaning units. Many of the older conventional cleaning units handling plus $\frac{1}{4}$-inch coal, can be operated at lower densities of separation. Such operation will recover the bulk of the cleaner coal at a sacrifice in coal recovery. At nominal investment costs, heavy medium units can be installed to recover the coal from the rejects from these existing units.

In some cases, the existing units can also reject a pure refuse product, so that the heavy medium cleaning unit need treat only a comparatively small tonnage of middlings. In other cases, the total reject of the existing units must be handled by the heavy medium installation. Depending upon the circumstances, the heavy medium installation may be required to re-treat as little as 15 per cent of the total feed tonnage.

Although partial cleaning of the minus 28 or 48 mesh coal is generally proving satisfactory in this country, more and more cases are arising where more efficient cleaning seems profitable. These extremely fine sizes are properly beyond the scope of gravity separations and the use of froth flotation seems desirable. As the investment and operating costs per ton for froth flotation are somewhat higher than for the cleaning of coarser coal by gravity methods, and as coal has been a relatively cheap

Here's the Pitch!

You can't beat this Keokuk team! For either blocking the open hearth heat or for charging the cupola . . . Keokuk is *always* a champion. "Pig for pig . . . car for car," the quality and uniformity of Keokuk Electro-Silvery *never* varies!



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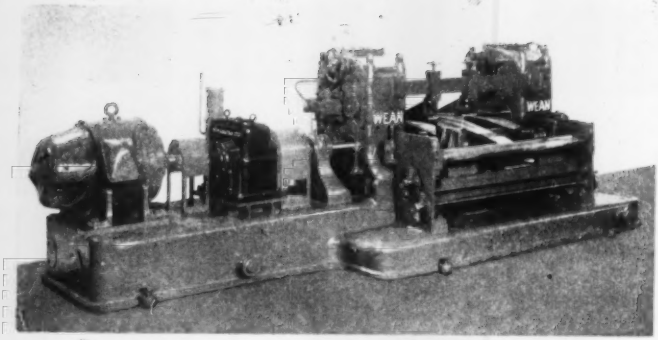

H & S SPEED REDUCERS play a part

in side trimming

strip steel at

high speeds

• Cutting strip steel at high speeds is a tough job and Horsburgh & Scott Speed Reducers play an important role as part of the Wean Side Trimmers . . . available in various sizes for edge trimming hot and cold rolled strip from .006" to ⅜" thick. This is only one of the many fields in industry where H & S Speed Reducers are handling tough jobs for long uninterrupted periods with great savings in maintenance. It will pay you to talk with our engineers about your speed reduction problems.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

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Send note on Company Letterhead for Speed Reducer Catalog 46

commodity in this country, froth flotation has so far, been little used here.

Pittsburgh Coal Co. has operated a commercial plant at their Champion No. 1 washery for years; a few installations are operating in Alabama; and one or two additional installations in the Pittsburgh district are contemplated or in course of erection. It is probable that use of froth flotation in this country to clean minus 28 or 48 mesh coal will increase, due to the following reasons:

1. Amount of these sizes in the mine output and their refuse content have increased materially.

2. Higher sales prices for coal makes their effective cleaning and recovery more attractive.

3. Their recovery materially reduces the problem of preventing stream pollution.

Coal's Surface Characteristics Important—Froth flotation of fine coal depends more upon the surface characteristics of coal and refuse than of their differences in specific gravity. In the flotation cells the feed pulp of fine coal and water, treated with the appropriate reagents, is aerated forming the froth which overflows carrying the coal. Refuse is discharged at a lower level with the bulk of the process water.

In Europe, during recent years, froth flotation has been rather widely used, particularly when the coal must be well cleaned for uses such as coke-making. In England its use is growing. Arthur Grounds, chief coal preparation engineer, British National Coal Board, and his assistant, Wilson Reed, in discussing British experience with froth flotation of coal in the November-December 1950 issue of *Deco Trefoil*, state that it is the most efficient method of cleaning extreme fine coal to zero.

Cost of froth flotation is three to four times the cost of cleaning larger coal, but it is still an economic proposition when coal, which would otherwise be lost, is recovered with marketable quality. Usually high rank coal—this includes most coking coals—respond readily, with a low consumption of reagents, to yield ash contents of 6 per cent or less with a simple circuit. Coals of lower rank respond less favorably, requiring more elaborate circuits, more reagent consumption and yield clean coal of higher ash content.

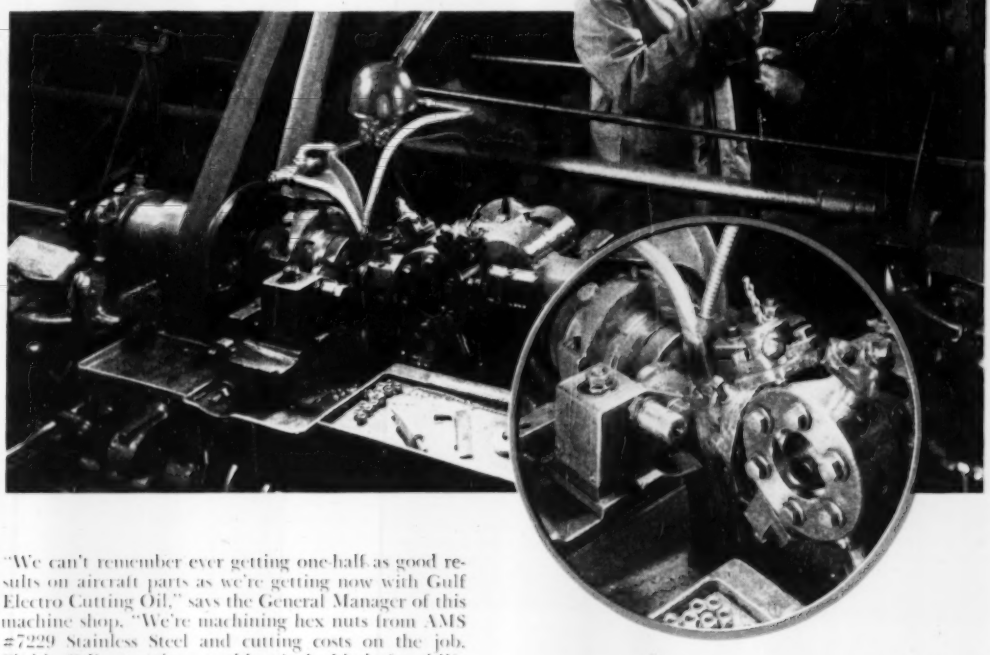
English Plant Produces Three Grades—In England one special use of froth flotation has been to produce a superclean coal from which to make low-ash coke for the manufacture of carbon electrodes. The Roddymoor froth flotation plant which makes three products—superclean

"With

Gulf Electro Cutting Oil

we get 800 pieces per grind drilling AMS 7229 stainless"

says this General Manager



"We can't remember ever getting one-half as good results on aircraft parts as we're getting now with Gulf Electro Cutting Oil," says the General Manager of this machine shop. "We're machining hex nuts from AMS #7229 Stainless Steel and cutting costs on the job. Finish O.K., no rejects, and here's the kind of tool life we get with this tough stainless:

Drills	-	700 - 800 pieces
Form tools	-	300 - 400 pieces
Cut-off tools	-	300 - 400 pieces"

Here's the important reason why Gulf Electro Cutting Oil is delivering such outstanding performance. Thanks to a special Gulf process of combining sulphur, Gulf Electro Cutting Oil provides greater sulphur activity over the entire range of the cutting operation. This intensified chemical action means better protection for the tool at elevated production rates — helps reduce built-up edge, prevents chip welding, prolongs tool life.

Operators like it because they get these production advantages without the disagreeable odor ordinarily associated with sulphurized cutting oils.

Call in a Gulf Lubrication Engineer today and arrange to use this outstanding oil in your shop, or send the coupon below for additional information.

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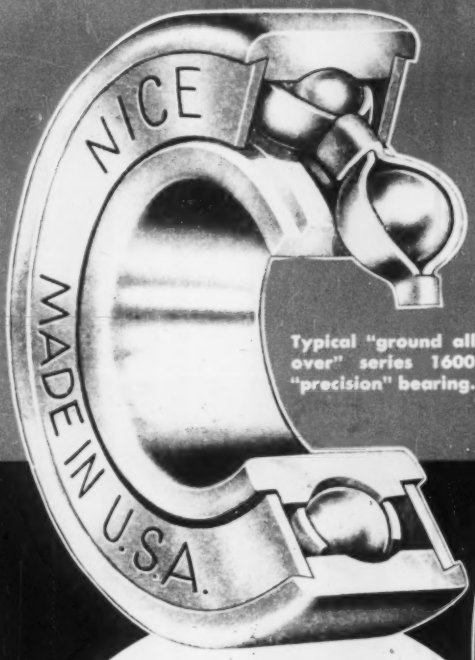


Typical "ground all over" series 1600 "precision" bearing.

Typical "unground" series 3000 "precision type" bearing.

NICE BALL BEARINGS

Yes, the bearings illustrated *are* identical, *except* for degree of precision. Because of the precision differences, there is a substantial difference in cost . . . NICE can provide bearings incorporating any degree or combination of precision features between the higher priced "ground all over" series 1600 and the low cost "unground" series 3000.

The specific requirements of your particular application should determine the precision features of the bearing you use. WHAT PRICE ARE YOU PAYING FOR PRECISION? ARE YOU BUYING MORE PRECISION THAN YOUR BEARING APPLICATION REQUIRES?

NICE

NICE BALL BEARING CO.

NICETOWN PHILADELPHIA PENNSYLVANIA

coal, low-ash coal for foundry coke and refuse.

In this country further development work must be done on froth flotation to make it more effective in reducing the sulphur content of coking coal. Normal reagents and operating conditions for optimum reduction of ash content have not been fully effective in removing pyritic sulphur. Considerable laboratory work has been done that points the way to more effective removal of sulphur and the higher value of coking coal should warrant these ideas being used commercially.

In conclusion, developments in bituminous coal cleaning are being largely dictated due to coal becoming a more valuable commodity; run-of-mine output is far dirtier, coal must be processed by efficient cleaning equipment and plants to more uniformly meet precise quality specifications and we have better equipment and knowlege to meet these conditions.

From a paper presented before the Eastern States Blast Furnace and Coke Oven Association, William Penn Hotel, Pittsburgh, Feb. 16, 1951.

RCA Offers New Vacuum System

A new vacuum system designed for a wide variety of uses in research, control and production has been added to the catalog of RCA industrial equipment. The instrument, designated the RCA type EMV-5 vacuum system, serves such applications as evaporation of metals and salts, sputtering, applying metallic films, vacuum distillation, drying, preparation of specimens for electron microscopy, study of discharges in gasses at low pressures, study of phosphors under electron and ion bombardment, and study of electrical and physical properties of materials at low pressures and in various atmospheres. It may also be used industrially for vacuum coating many items such as mirrors, lenses, vacuum tubes, and plastic objects on a production basis.

Aids Bolt Separation

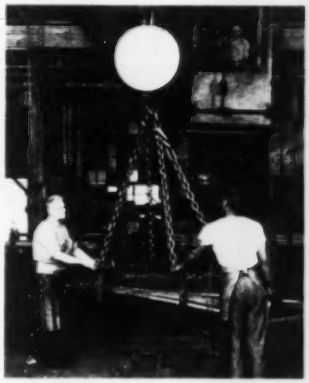
A magnetic comparator, installed in a specially-designed test bench at Russell, Burdsall & Ward Bolt & Nut Co., Rock Falls, Ill., enables one operator to separate mixed bolts at a rate of 2200 an hour.

According to chief metallurgist C. K. Hayward, unseparated bolts previously were sold at the classification of the lowest grade material in the mix, meaning considerable loss. To eliminate this, they had to separate large numbers of bolts from mixes of differing material.

To facilitate the sorting operation, Mr. Hayward designed and built a special testing bench, incorporating a General Electric magnetic comparator. Basically an impedance comparator, the device correlates, through the use of standard or reference specimens, the chemical and physical properties of the bolts being separated with the electrical and magnetic characteristics. Variations are shown on an indicator.

Transit Weighing Effects Savings

TIME required to weigh 5-ton rod loads at its mill is pared 75 per cent by Riverside Metal Co., Riverside, N. J., producer of nonferrous sheets, strip, rods and wire. The weight information is required in computing



WEIGHING TIME CUT 75 PER CENT . . . *manpower requirements also trimmed*

payroll and production data. Installation of a 20,000-pound capacity dial reading scale made to Riverside's specifications by Hydroway Scales Inc., Detroit, made the savings possible.

Normally the scale is hooked below the lower block of the mill crane by the oval eye built into the scale body throughout the entire shift. Tackle around the rod loads is made fast in the conventional manner to the hook extending below the scale.

Load weighing previously took 5 minutes and required the attention of three men plus a foreman who recorded scale readings. Now the crane operator observes and records the scale readings on all loads while they are in transit and cuts weighing time to an average of a little more than a minute.

When not in use for extended periods, as between shifts, the device is unhooked from the crane and placed to one side in its own specially designed cradle. The arc welded cradle is constructed of ¼ and ⅛-inch steel plate and is mounted on casters for easier moving on the mill floor. It is so designed that, when the scale is resting in it, the comparatively fragile dial face is tilted away from the cradle back piece reducing the likelihood of scuffing or possible breaking of the glass face.

NBS Opens New Electronics Lab

Establishment of a new National Bureau of Standards laboratory center at Corona, Calif., to be devoted to various phases of electronic research, development, and engineering is announced. To be known as the Corona Laboratories, National Bureau of Standards, the new research center will be primarily concerned with technical problems of importance to the Department of Defense. The site was transferred to NBS by the Department of the Navy because of the bureau's urgent need for new facilities. About 22 buildings are being renovated to accommodate NBS research and development activities being transferred there from Washington. Dr. R. D. Huntoon, formerly chief of the NBS atomic and radiation physics division, has been named associate director to head the new laboratories, which are expected to be in essentially full scale operation by September.

The site has the advantage of proximity to other important research centers, especially the Navy installations at Inyokern and Pt. Mugu and the aircraft industries in the Los Angeles area. Eighteen months to two years construction time was saved because existing buildings at Corona were easily adaptable to NBS research activities.

In the near future the most important activity at the Corona laboratories will be the development of guided missiles. Every phase of missile development will be covered from theoretical and applied research to construction of experimental parts and units.

Brake Service Manual Available

A new brake service manual is available from the automotive division of Warner Electric Brake & Clutch Co., Beloit, Wis.

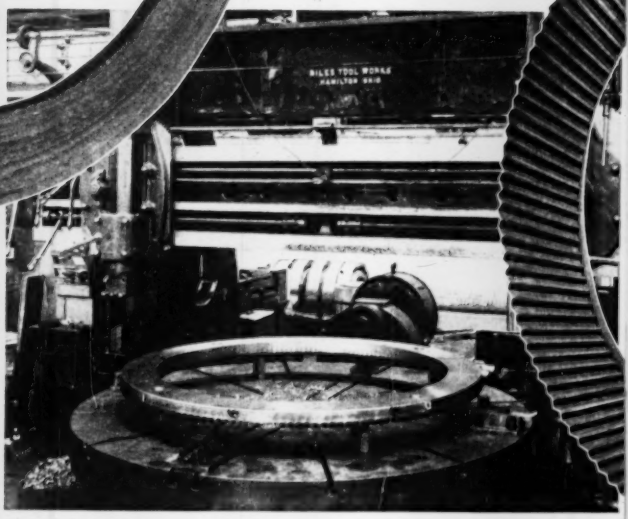
The new booklet provides complete instructions for installation, servicing and trouble-shooting on all their electric brakes for commercial and coach trailers. Instructional material has been simplified and is arranged so that even inexperienced service personnel will find it easy to understand.

THE STANDARD GIVES

NOTICE: DESIGN AND PURCHASING DEPARTMENTS

Standard's three-unit mills—each composed of a horizontal mill and two steam hammers for preliminary operations—can roll practically all sizes of rings up to a maximum of 12-feet outside diameter. Let us quote on your requirements.

Standard Weldless Ring Blank, rolled to close tolerances for conversion to a table rack spiral bevel ring gear for a boring mill.



Finish-machining the ring gear on a Niles vertical boring mill. Teeth have already been cut.

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WELDLESS RINGS,

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BALDWIN

STEEL WORKS ROLLED GEAR BLANK

THIS RING GEAR

a better start in life

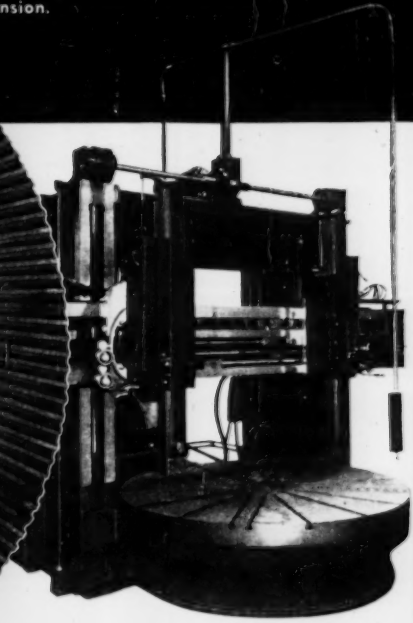
The finished ring gear. Uniform metal structure assures high precision in gear tooth form and dimension.

The job of the table-rack spiral bevel ring gear on a modern boring mill is rough, rugged and responsible—and the only way to get the essential physical properties *in the gear* is to have them *in the blank*. Strength—to take the stress and strain of high-speed production with deep-cutting carbide tools. Uniform structure—to permit the precision machining that is the basis of precision operation. Accuracy in dimension—to save machining time and waste.

Standard Steel Works blanks meet every requirement. Starting with steel produced in Standard's own open-hearth furnaces, the rings are rolled to close tolerances to develop every desirable property inherent in the metal . . . heat treated to further improve service characteristics. If you have a ring-gear problem, Standard blanks may provide the solution you are looking for. You'll find Standard an ideal supplier—big enough to handle the most demanding jobs . . . small enough to make every job a matter of direct personal concern.

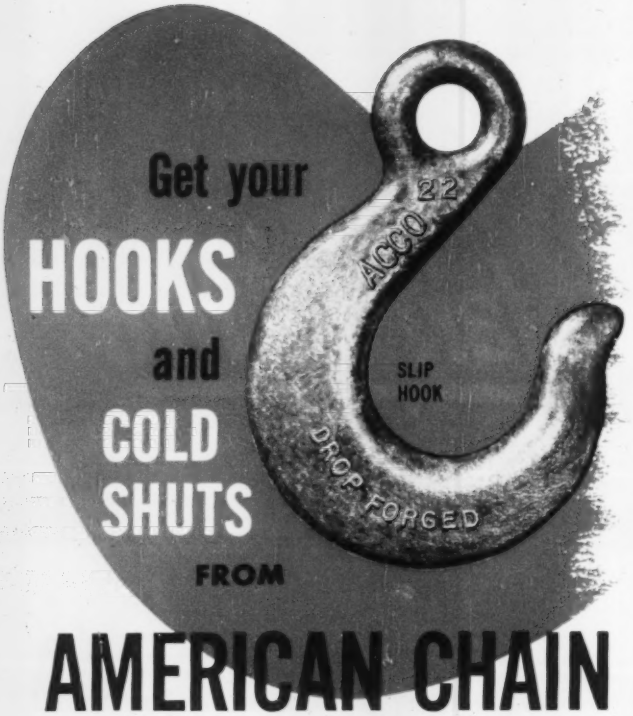
STANDARD STEEL WORKS DIVISION
Burnham, Mifflin Township, Pennsylvania

BALDWIN-LIMA-HAMILTON CORPORATION
Philadelphia 42, Pa. • *Offices in Principal Cities*



Niles 10-foot hydraulic feed vertical boring mill; table is driven by the gear shown. This is a high-production machine, for use with carbide tools—which calls for high strength in the drive gear.

-LIMA-HAMILTON



AMERICAN CHAIN

GRAB HOOK

#1 COLD SHUT

S-HOOK

● A complete line of slip and grab hooks, two styles of cold shuts, and S-hooks are made by AMERICAN for use with all types and makes of chain. You can also get from AMERICAN a wide variety of shackles, rings, links, swivels, toggles, and special attachments ...all made by AMERICAN to time-tested specifications.

You Can't Buy Better Chain!

AMERICAN has made good chain for a good many years. We've learned how to make good chain better. Make sure you get the best.

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AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

Production, Inventory Control

(*Continued from Page* 76)

been a serious shutdown in this company due to failure in having men, material, and machines available at the right time and place in the right quantity, except for a few strikes in its own plants, or in those of its vendors.

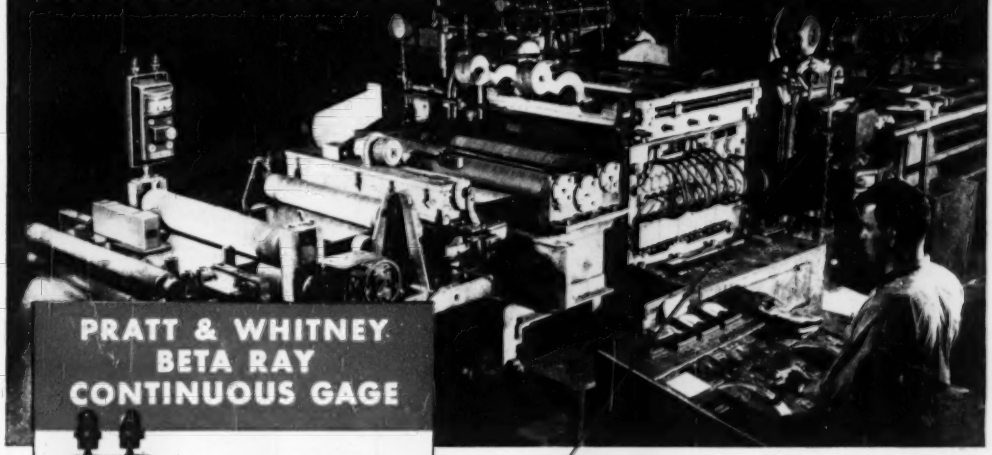
To accomplish this control requires a purchasing and production planning staff of approximately 50 people. Their salaries amount to ¼ of 1 per cent of the sales dollar, or about 80 cents per engine. However, a large layout and standards group of 40 people is required in the engineering department, who should be added to this group for the true cost of securing this control. This total cost of approximately ½ of 1 per cent of the sales dollar is practically the same as in the previous example. This is a coincidence, as actually this ratio has a very wide range, and is related more to the degree of control secured than it is to the size or character of the enterprise.

Job-Order Shop—A job-order shop neither stocks a product nor has one of its own. It manufactures entirely to customer's design, specifications and quantities. Commercial foundries, forge shops, stamping plants, structural shops and general machine and construction shops are characteristic of this class in the metalworking industries. Typical runs are relatively small in quantity and usually there is no assembly.

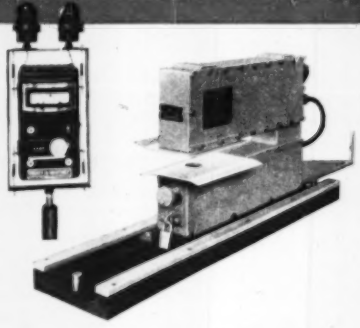
Actually there is no difference in production control principles and techniques for either production or job-order shops. The only difference is in the details of application. In job shops all the elements of control, such as bills of material, machine loading, schedules, etc. are in a constant state of flux requiring continuous addition and clearance of order quantities, continuous planning and rearrangement of scheduling and loading, and constant detail record follow-up. There is one other important difference, the job shop is subject to uncontrollable fluctuations in its volume due to the lack of control over its market.

Typical of this type of shop is a plant up in Canada manufacturing steel and iron castings, ornamental and general structural work and custom-made material handling machinery. Its annual volume amounts to $3 million. It had a complete engineering department, which issued the necessary bills of material and process sheets. It had no raw material stock records, no work standards, no machine loading. Deliveries were secured, if at all, by a large crew of

P&W BETA RAY GAGES AND *Syncro Timer* TEAM-UP FOR PRECISE MEASUREMENT AND CONTROL OF TIN PLATE SHEAR LINES IN MOST LARGE STEEL MILLS*



PRATT & WHITNEY BETA RAY CONTINUOUS GAGE



measures thickness *change* of the strip, which is in direct relation to absorption of electrons from radio-active (Strontium 90) source. Control meter indicates change and supplies a controlling impulse to Syncro Timer for sorting off-gage sheets.

Electrical components of Gage made by General Electric Co.

THERE'S no better precision equipment available than the P&W BETA RAY CONTINUOUS GAGE for accurate, non-contact gaging of high-surface-finish strip on electrolytic tin plating and shearing lines.

And, after the strip is cut, the P&W SYNCRO TIMER fits in perfectly for remote-control sorting and diverting of off-gage (light or heavy) sheets regardless of shear line acceleration or deceleration.

Take our word for it — and that of the leading steel mills — this P&W precision-team performs with unmatched efficiency and savings in time, labor and money.

PRATT & WHITNEY *Syncro Timer*

an efficient remote control timing device used in the steel industry for continuous, automatic sorting of sheared sheets. View shows single unit with cover removed.

* *Installations are completed or in process in mills of the following companies: Jones & Laughlin, Kaiser Steel, United States Steel, Wheeling Steel and Youngstown Sheet and Tube.*

PRATT & WHITNEY

Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT

Complete Details from any P&W Branch Office:

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Dallas (The Stanco Co.) • Detroit • Houston (The Stanco Co.)
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Do you use Perforated Metal?

If perforated metal is required for any of your products, let Hendrick quote on fabricating it to your specifications. An unsurpassed stock of tools and dies, and ample plant facilities, enable Hendrick to give unexcelled service in furnishing perforated metal with any shape or size of openings, from any commercially rolled metal, in any desired gauge. Write for full information.

1876—Seventy-Fifth Anniversary—1951

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Sales Offices In Principal Cities

Perforated Metals
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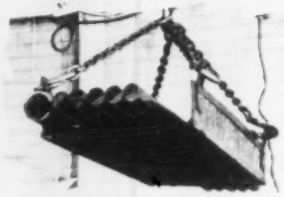
Job-Designed Handling Equipment

Cuts Handling 40-50%

If you are working with odd lengths . . . bars, tubing, extruded or rolled products . . . your handling problem is right down the alley for Powell Job-Designed materials handling containers. Powell equipment at work in plants handling long stock has cut handling and inventory costs as much as 50 percent. Contact your nearest Powell representa-



POWELL PRESSED STEEL SINCE 1920

Faster delivery of your materials handling equipment is assured if you can furnish either a government D. O. number or the steel.

Send inquiries to Dept. 371

THE POWELL PRESSED STEEL CO. • HUBBARD, OHIO

ORIGINATORS OF COLD FORMED ALL STEEL HANDLING EQUIPMENT

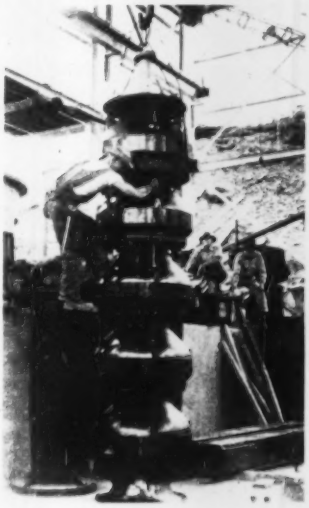
(In Greater Youngstown)

stock chasers under the superintendent. Scheduling was done entirely by department foremen from the manufacturing orders that were released as soon as the bills of material and process sheets were issued. Lack of material and unrealistic delivery dates kept the manufacturing departments in a continuous state of confusion. Costs were naturally high.

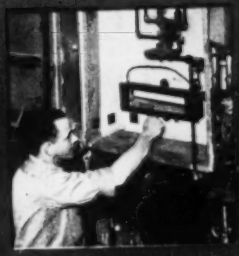
Order was brought out of this chaos by: (1) Establishing a production and material control department to co-ordinate the functions of engineering, procurement and manufacture, (2) determining work loads by department and machine, and correlating these capacities with delivery requirements, by means of weekly schedules, and (3) dispatching the orders in accordance with the availability of material and equipment.

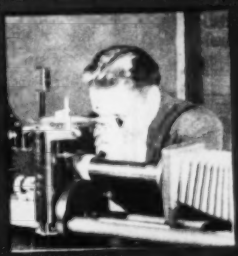
Weekly Communique—As soon as this plan got into operation, it was discovered that delivery promises would have to come from production

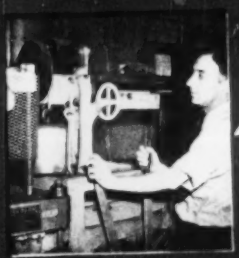
Fear of Drought Disappearing



INSTALLATION of six vertical close-coupled turbine type pumps like the one shown above will prove to be a big step forward in the solution of New York city's water shortage. Peerless Pump Division, Food Machinery & Chemical Corp., Los Angeles, designed and built the 2500 hp units and they are being put in place at Chelsea, N. Y., on the Hudson river. Each pump is rated at 14,000 gpm against a head of 600 feet, consists of five stages with 36-inch diameter bowls. Five pumps will be on the line at one time with the remaining unit in a standby condition







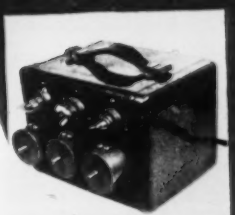
10 Checks—

To Guarantee Performance WHEN YOU USE RELIANCE *Spring* LOCK WASHERS ON YOUR PRODUCT

You take no chances when you buy Reliance Spring Lock Washers because nothing is left to chance in their manufacture.

Every precaution is taken to insure their quality and satisfactory performance on your product. The steel is purchased to rigid specifications and drawn in our own mill. Every phase of production is under tight control of Reliance metallurgists and constant checks throughout the manufacturing processes guarantee quality, accuracy and satisfaction.

You're *always* on safe ground when you order Reliance Spring Lock Washers.



EATON

EATON MANUFACTURING COMPANY

EATON

RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

In Canada: Eaton Automotive Products, Ltd., London, Ont.

Ⓑ Special Ladder Bolt

Won't let you down... whether it's of wood or metal fabrication there's a place for Ⓑ Special fasteners. Many wooden products such as ladders, chairs, beds and tables get their strength from the Ⓑ line of bolts. Your problems cheerfully become ours when it comes to special bolts and headed rods.

Bolts...by the Carton or Carload

BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

NORTH TONAWANDA, NEW YORK

Sales Offices in Principal Cities. Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

Our Specialty is "SOMETHING SPECIAL"

control rather than from sales. This was not done for each order, but by a weekly communique to the sales department advising them, from the amount of load on the plant, what delivery period promises could be made on new orders received during the coming week.

Some gratifying results became evident by the end of the third month. Business was coming in at an increasing rate and more uniformly, and reductions in cost were accruing at the rate of $50,000 per year. No additional costs were incurred by staffing the production control department as the reduction in stock chasers that resulted paid for the additional clerks required to maintain a co-ordinated and effective control.

No special and no different principles or techniques of control were required. More detail paperwork was generated, but it replaced other types of activities and was pretty much self contained with the production control department.

Heavy-Media Cleaning Grows

Cleaning of bituminous coal by the heavy-media separation method increased 691 per cent in three years using 1948 as a base while cleaning by all other methods combined increased 14.5 per cent in the same period. These facts are reported as the result of a survey by the Mineral Dressing Division, American Cyanamid Co., New York.

In 1948 the heavy-media method was used to clean 1.72 per cent of all bituminous coal. This grew to 7.8 per cent of the total by 1950. Last year there were 48 heavy media plants in operation or under construction. This trend prompted the company to issue a 36-page book, *Coal Preparation*, covering fundamental principles of the process with illustrated operating plants, flow schemes and other useful data. It is available to coal producers from the company at 30 Rockefeller Plaza, New York 20.

Thermostat Bulletin Offered

A new bulletin describing type W bimetal strip thermostats for use in refrigerators, electronic and avionic devices, fans on rectifiers, and industrial apparatus is announced by Stevens Mfg. Co. Inc., Mansfield, O.

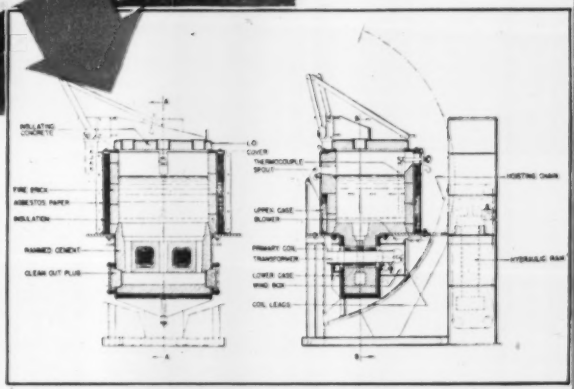
Illustrated with photographs showing various terminal arrangements available on adjustable and nonadjustable styles, dimensional drawings, schematic diagrams of operating principle, and a typical type W thermostat response curve, it is available on request.

AJAX TAMA-WYATT INDUCTION FURNACES

Cut Foundry Melting Cost

Accurate records at the National Pressure Cooker Co., Eau Claire, Wisc., show that over a two-year period the Ajax induction furnace was capable of reducing melting costs by as much as 40%.

Partial view of National Pressure Cooker Co.'s melting room showing Ajax induction furnaces.



Cross section drawings of 166 kW. twin-coil Ajax Induction Furnace with hydraulic tilting device, same as shown in photograph above.

Due to the nature of their use, pressure cooker castings must maintain exceptionally high standards of casting quality. Not only does the induction furnace effect a saving in melting cost but, in addition, working conditions are greatly improved.

Note from the diagram above that the operation of the Ajax furnace is based on the induction principle, whereby energy is transmitted to the molten charge without actual contact, through the refractory walls. Only the metal is heated, and therefore there are no resistors or other parts having a higher temperature than is absolutely necessary for properly melting the charge. A gentle movement of the bath insures uniform temperature and homogeneous mixing of the ingredients. Linings are made of inert refractories which do not contaminate the melt. Temperature control is entirely automatic.

Write For Further Facts and Information

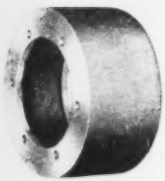
AJAX TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Normalized High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Multiplex Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Rapid Induction Furnaces for Melting

going around in circles over armament ring problems?



BOGIE BANDS

STAINLESS STEEL RINGS

TURRET RINGS

If you're going around in circles over armament ring problems, contact industry's specialist, the Cleveland Welding Company. They are the nation's leading producers of circular rolled and welded steel products, supplying bogie bands for tanks, stainless steel rings for aircraft, rings for anti-aircraft guns, and many other circular parts. Ring problems get a fast solution at Cleve-Weld since we have specialized for 40 years in the mass production of these items. Technical know-how plus modern efficient equipment designed for our own use assures you of quality, economical production. Write for our general catalog today.

THE CLEVELAND WELDING COMPANY
Dept. S • W. 117th St. and Berea Rd. • Cleveland 7, Ohio
a subsidiary of
AMERICAN MACHINE & FOUNDRY COMPANY

CALENDAR
OF MEETINGS

Denotes first listing in this column.

July 13-14, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Edgewater Beach Hotel, Chicago. Association address: 1024 National Press Bldg., Washington 4.

†**July 23-27, American Association for the Advancement of Science:** Annual Gordon Research Conference on Corrosion, New London, N. H. Conference director's address: Dr. W. George Parks, Rhode Island State University, Providence, R. I.

†**July 30-Aug. 2, American Electroplaters' Society:** Annual convention, Statler Hotel, Buffalo. Society address: P.O. Box 168, Jenkintown, Pa.

Stainless Display on Road

A traveling display panel, prepared by the committee of stainless steel producers, American Iron and Steel Institute, and featuring advantages of stainless steel as a building material, is now being exhibited in 14 schools of architecture in the east and midwest.

By means of photographs and actual metal samples, the display emphasizes the usefulness and enduring beauty of stainless for architecture. Examples shown of forms in which stainless is used are curtain walls, building entrances, letters for signs, roofing and drainage components, flashing, spandrels, and trim for store front construction. In addition, there are also displayed 16 typical products, such as letters, mullions, sills, hardware, fasteners, hinges, grilles and screens, and switch and outlet plates. One section of the panel demonstrates the weldability of stainless, and the technique of blending the weld to the adjacent metal.

Stud Welding Booklet Issued

KSM Products Inc. is making available a booklet containing helpful information for engineers, purchasing agents and welding superintendents concerned with applying studs and other fasteners to steel surfaces. It contains data on how stud welding eliminates drilling, tapping and hand welding. It shows the fundamental operating principles of the stud welding process and typical applications.

Copies of catalog 451 are available from the company at Merchantville 8, N. J.

Thermocouple Chart Offered

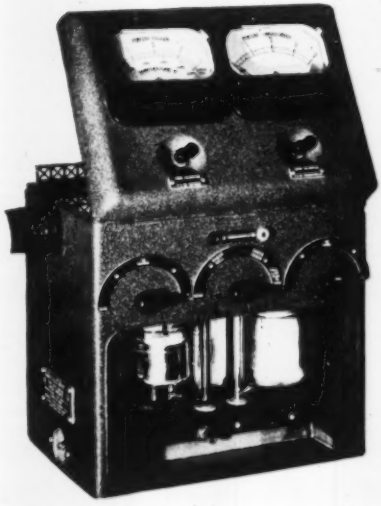
A new chart is offered by Thermo Electric Co. Inc., Fair Lawn, N. J., which shows applications, calibration symbols, conductors, polarity and color codes of thermocouple and extension wires. Resistance tables are shown on the reverse side.

Mobilizing BTU's

Now that the "heat's on" for record production, the calls are increasing for the services of the Cities Service Heat Prover. This scientific instrument gives an accurate, instantaneous and continuous picture of combustion conditions in all types of furnaces.

You'll readily be able to calculate any oxygen excess, waste combustible matter, and potential fuel savings. The results are like an accurate "diagram" of corrective measures needed to conserve heat units for consistently higher production at lower cost.

You'll see profit in applying the Cities Service Heat Prover . . . *not an instrument you buy, but a service we supply!* Call or write your local Cities Service office about arrangements. Or simply return the coupon today.



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Chillo Cutting Oils • Trojan Greases • Trojan Gear Oils
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CITIES SERVICE OIL CO.
Sixty Wall Tower, Room 20
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Without obligation please send your booklet, "Combustion Control for Industry."

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CITIES SERVICE
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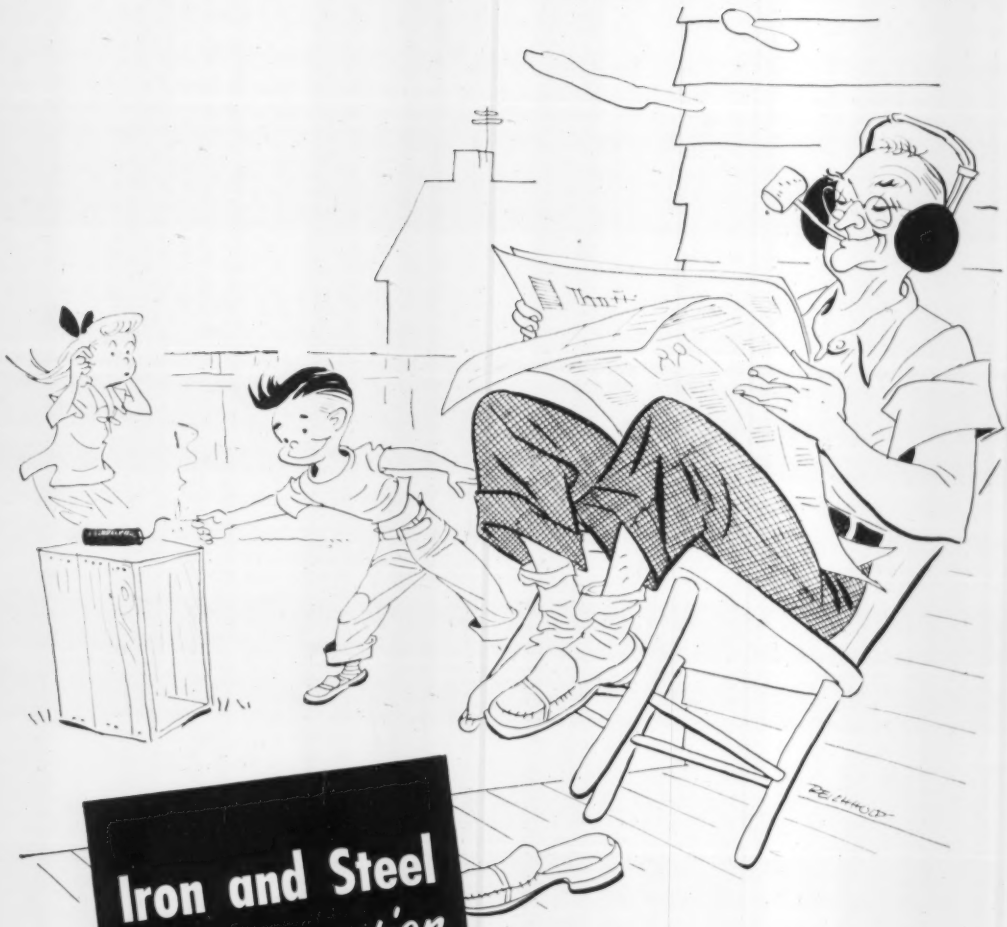


Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

pittsburgh...pennsylvania

the world's largest job galvanizing plant

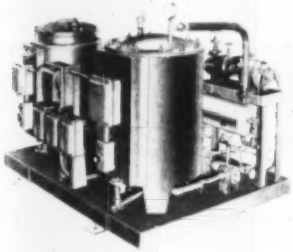
in the heart of the STEEL INDUSTRY

galvanizing....pickling....painting....oiling

New Products and Equipment

Oil Reconditioner

A 25 to 40 gallon per hour oil conditioner unit designed for small batch clarification of used hydraulic, lubricating, run-in and transformer oils is being produced by Filtration Division, U. S. Hoffman Machinery Corp., 219 Lamson St., Syracuse 6, N. Y. Both



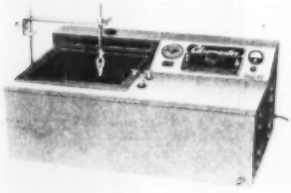
insoluble and soluble impurities are removed by the unit.

Cartridge filter and vaporizer which form the unit are mounted on a common base that is portable if desired and are complete with all necessary electric and pump connections. Filter and vaporizer may be operated singly or together. Overall dimensions of the conditioner are: 54 inches wide, 42 inches deep and 37 inches high.

Check No. 1 on Reply Card for more Details

Hard Chrome Plater

A production tool for precision industrial hard chrome plating directly on cutting tools and wear parts is provided for the metalworking industry by the Industrial Chrome Division, Ward Leonard Electric Co., South St.,



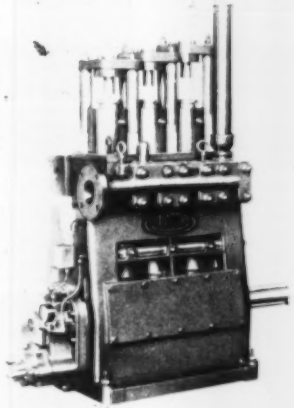
Mount Vernon, N. Y. Model A-50 Chromaster used in combination with Chromasol solution increases the average life of cutting tools and wear parts several times after only 3 minutes plating time.

Bench mounted plating unit has a capacity for hard chrome plating metal surfaces totaling 25 square inches maximum at the recommended current density of 2 amperes per square inch. It consists of a built-in selenium rectifier power supply, rectangular plating tank and instrument panel. Current control is by means of a continuously adjustable autotransformer. Cabinet measures 14 inches high by 32 inches wide by 19 inches deep. The chrome plating unit operates from single phase 100-120 volts ac 60 cycle.

Check No. 2 on Reply Card for more Details

Triplex Pump

The Aldrich Pump Co., Allentown, Pa., announces the addition of a 3-inch stroke triplex direct-flow pump to its overall line. Unit can operate at speeds up to 500 rpm and gives more work from a lighter, more compact pump. Power ranges up to 50



hp, pressures up to 3800 psi and displacement up to 96 gallons per minute at 790 psi, 500 rpm.

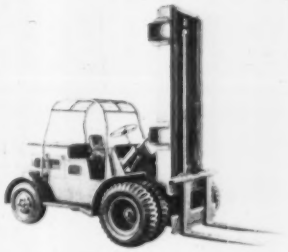
Pump passes liquid in a straight line directly through the working barrel. Elimination of two right angle turns in the fluid-end block improves volumetric efficiency and saves material. Fluid-end is sectionalized in construction simplifying maintenance. Change in plunger size can be readily made to meet alterations in pressure or capacity.

Check No. 3 on Reply Card for more Details

Outdoor Worker

Capable of handling 15,000-pound loads, Yardlift-150 is added to its line by the Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Steel mills, warehouses, automotive body plants, etc., are possible users of the truck.

Steering and maneuvering are no problem despite the truck's large size. Maneuverability is achieved by use of a 22-inch diameter hand wheel which operates a hydraulic power steering control. In case of engine stoppage, the steering linkage can be

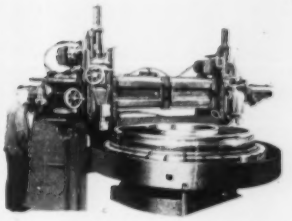


operated mechanically. An extra-wide axle provides maximum stability under loads. Heavy frame construction and all components are designed for providing reserve strength in extreme service.

Check No. 4 on Reply Card for more Details

Heavy-Duty Grinder

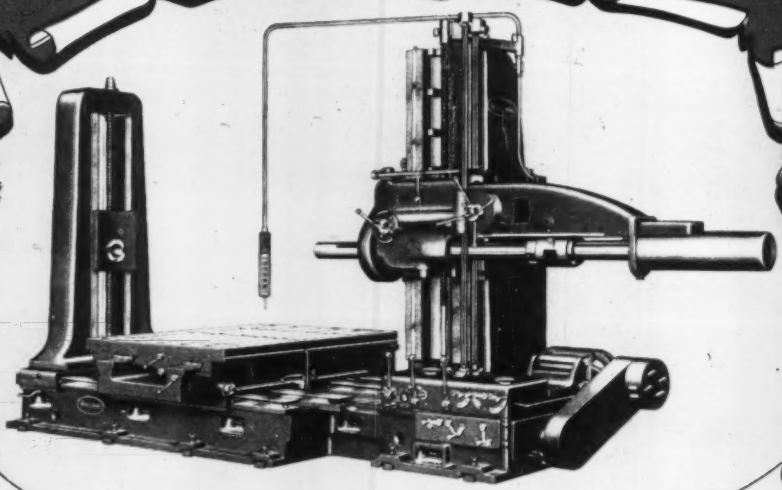
Accuracy in handling large internal, external and surface grinding, as well as light precision boring and turning makes the double-head, heavy-duty, grinders made by A. Harold Frauenthal Inc., Muskegon, Mich., suitable for a variety of big grinding jobs that still require high precision. Combination of rugged construction and wide swing-range up to 150-inch diameter permits grinding of diameters and parellel faces consistently to the tolerance of 0.0002 to 0.0003-inch at their maximum swing. Angular ac-



curacy is produced with less than 0.0005-inch tolerance in 72 inches.

Semisteel cast table has deep radial ribs to prevent deflection and radial T-slots for clamping the workpiece. Extra large diameter of flange on the spindle permits wide radial spacing of heavy bolts and prevents any tendency of table tilting under uneven loading. Self-contained table drive

NOW — 4 WAY Bed Construction



BULLARD

HORIZONTAL BORING MACHINE

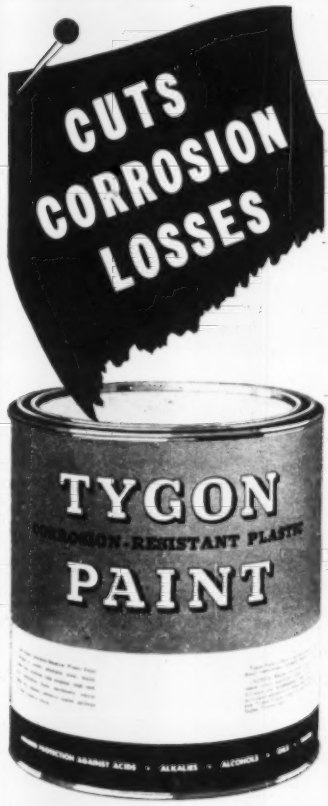
In addition to the Bullard 4-way bed construction, other design improvements such as protected bed-ways, non-metallic bearing surfaces under table and saddle, and adjustable nuts for table and saddle feed screws are a few of the improvements that place these 4" and 5" spindle machines on your list for investigation.

Furthermore, don't forget—convenient right hand operation, safety features and hydrodynamic drive.

Write Bullard for other details

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT



TYGON plastic Paint protects metal, concrete and wood from attack by acids, alkalies, oils, fresh or salt water. Tough, flexible film resists impact. Non-contaminating to solutions.

● *Write for Test Samples*

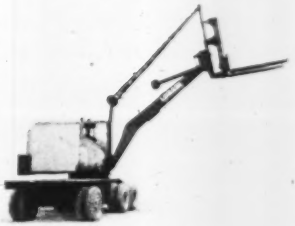
U. S. STONEWARE
Akron 9, Ohio

has infinitely-variable speed, a reversing unit and a remoté-control dial speed indicator. Table speed can be instantly increased or decreased for most efficient grinding by pushbutton control.

Check No. 5 on Reply Card for more Details

Load Swings Freely

Thew Shovel Co., Lorain, O., has developed a swing-stacker for handling unusual lifting requirements. A standard Lorain SP-414 self-propelled carrier and turntable are used, mounting a specially designed front end that consists of a hydraulically



operated fork lift attachment fixed to a boom. The 7-foot forks have a vertical lift of 9 feet 8 inches, can rotate 180 degrees and can be tilted up and down approximately 10 degrees.

With boom completely raised and the fork lift completely elevated a height of 27 feet can be reached. In addition the turntable and fork lift front end can revolve through 360 degrees. Machine has a top travel speed of 7 mph with load. Lifting capacity in any position is 5000 pounds.

Check No. 6 on Reply Card for more Details

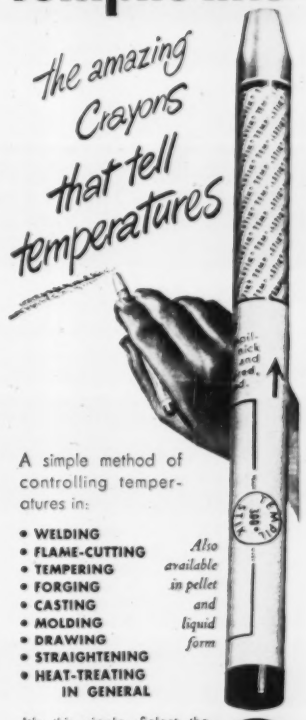
Rugged Chemical Motors

Type CSP Life-Line motors designed for applications where corrosive fumes and liquids are encountered are available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Frames, brackets, hoods and other exposed parts are alkali-cleaned, hot-water rinsed, then rinsed in chromic acid spray. After drying they are sprayed with phenolic-alkyd-type enamel and baked. Additional protection is provided by a coat of gray enamel and two to four baked dips of thermoset varnish followed by a final coat of gray lacquer.

Motors use bronze split-hub, clamp-type blowers for corrosion resistance. Rotating neoprene slingers on the shafts between rear brackets and hoods are used to prevent the entrance of dirt or liquids into the bearing housings. Stator windings are

Tempilstiks°

the amazing Crayons that tell temperatures



A simple method of controlling temperatures in:

- WELDING
- FLAME-CUTTING
- TEMPERING
- FORGING
- CASTING
- MOLDING
- DRAWING
- STRAIGHTENING
- HEAT-TREATING IN GENERAL

Also available in pellet and liquid form

It's this simple: Select the Tempilstik° for the working temperature you want. Mark your workpiece with it. When the Tempilstik° mark melts, the specified temperature has been reached.

$2 each — gives up to 2000 readings

Available in these temperatures (°F)

113	263	400	950	1500
125	275	450	1000	1550
138	288	500	1050	1600
150	300	550	1100	1650
163	313	600	1150	1700
175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
213	363	800	1350	1900
225	375	850	1400	1950
238	388	900	1450	2000

FREE —Tempil° "Basic Guide to Ferrous Metallurgy" — 16¼" by 21" plastic-laminated wall chart in color. Send for sample pellets, stating temperature of interest to you.

GORDON SERVICE

CLAUD S. GORDON CO.
Manufacturers & Distributors
Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines
Dept. i4 • 3000 South Wallace St., Chicago 16, Ill.
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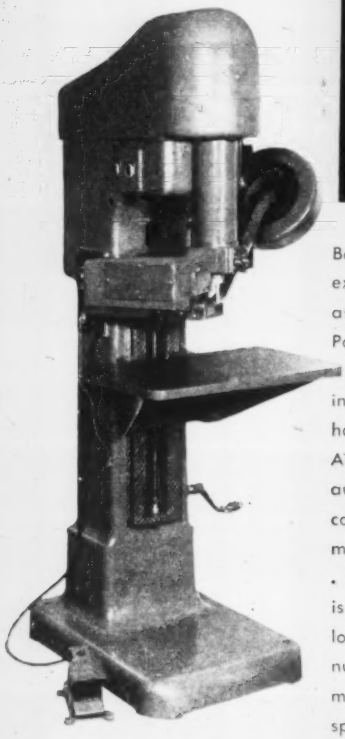
Gigrin D.P.S. Comes Through

WITH A SOLUTION TO ANOTHER PRESENT-DAY PRODUCTION PROBLEM—NUT DRIVING

No Need to Limp Along With Slow Hand-Operated Tools—

USE THIS REMARKABLE NEW NUT DRIVER



Backed by a quarter century's experience in meeting production assembly problems, the Detroit Power Screwdriver Company replaces another outmoded method in bringing out this outstanding hopper-fed nut-driving machine . . . Amazing speed is attained, either automatically or semi-automatically, in driving nuts from 5/16" minimum to 11/16" maximum across flats . . . The manual handling of nuts is entirely eliminated except to load the hopper which feeds the nuts to the driving spindle. The machine is equally efficient for special nuts such as Jam, Castellated, Lock, etc.

Send for further details, also information about D.P.S. Power Screwdrivers, Motorized Hopper Units and Special Assembling Machines.

1926 Our 25th ANNIVERSARY 1951

DETROIT POWER SCREWDRIVER CO.

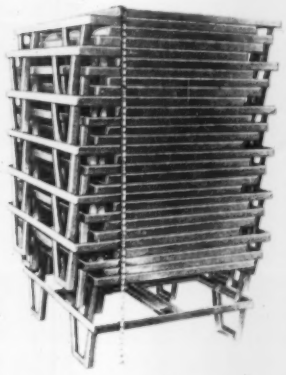
2811 W. FORT ST. DETROIT 16, MICH.

double-dipped and baked in thermoset varnish. The gasketed conduit box can be rotated to meet installation requirements.

Check No. 7 on Reply Card for more Details

Space Saving Skids

Nesting steel skids designed for use for all types of hydraulic and electric floor trucks are announced by Bloom System Inc., 19143 W. Davison Ave., Detroit 23, Mich. A total height of 5 feet from floor level to top of stack is required to nest 30



skids as shown in the illustration. Skids are light enough to be handled by one man.

Savings in floor space result in added handling capacity for movement of material and stock. Skids are available in standard models as well as in specially designed units to meet individual requirements.

Check No. 8 on Reply Card for more Details

Pocket-Size Strapper

For pulling strapping of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ or $\frac{3}{4}$-inch tight around any size or shape object, A. J. Gerrard & Co., 1950 Hawthorne Ave., Melrose Park, Ill., developed a tool compact enough to slip in the pocket when not in use. Known as the No. 120 Steelbinder it operates like the larger models except that it does not cut off surplus strap as an integral part of its binding action. Short end handles adapt this model to close quarter work as on ladders, scaffolding, etc.

Check No. 9 on Reply Card for more Details

Vertical Hydraulic Driller

Standard Machine & Tool Co. Ltd., Windsor, Ont., introduces four vertical type hydraulic drilling machines available in the U. S. The Drillmasters are designed in 3, 5, 10 and 15 hp models. Column castings are alloy iron with the ways being flame

The SHORTEST WAY

See This New Doehler-Jarvis 16mm Sound Motion Picture on Die Casting and Finishing

See it in your own office or plant with your Executives ... as guests of Doehler-Jarvis

We'll send along a Lecturer for Question & Answer Period. (Film running time: 27 Minutes)

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Refractory Porcelain Specialties in stock or designed to meet specific needs. Flasks, retorts, crucibles, etc. and parts "custom-made" to do the job.

for Carbon and Sulphur Determinations

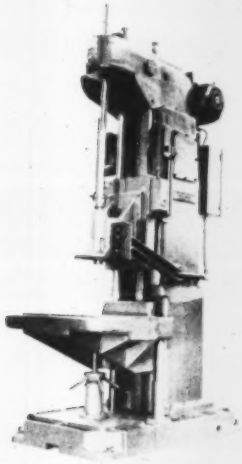
Precision made in every detail, McDanel High Temperature Porcelain Combustion Tubes have been favorites in America's metallurgical laboratories since 1919. Made of a highly refractory porcelain body and recommended for 2900 F. service. McDanel Tubes give maximum resistance to thermal shock. Their long life keeps control costs at rock bottom.

Write Today for 1951 Catalog
"McDanel Industrial Porcelains"

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

hardened and ground. Geared head mounted on top of the column provides a large range of speeds through use of pick off gears.

Actuation of the sliding head uses a hydraulic type feed and traverse circuit giving feeds from $\frac{1}{2}$ to 12 inches per minute. Dwell is obtained by the setting of a valve. Skip feed



and step drilling can be included if desired.

The 3 hp machine has a 12-inch stroke with a drilling capacity of $1\frac{1}{2}$ inches in steel at 0.010-inch feed per revolution. The 5 hp machine has a 15-inch stoke with a drilling capacity of $2\frac{1}{2}$ inches in steel at 0.010-inch feed per revolution.

Check No. 10 on Reply Card for more Details

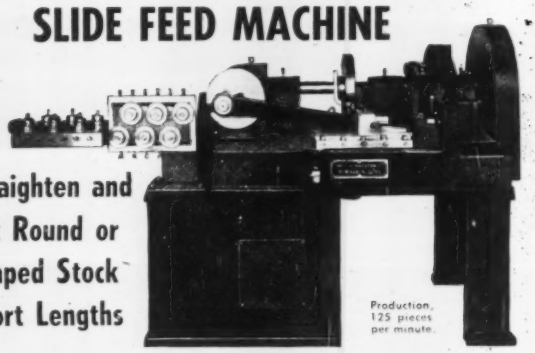
Precision Driller

Wales drilling machine for precision layout, drilling and reaming of holes is announced by Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. It combines simplicity of operation with easier locating, drilling and reaming of holes in material of practically any length and up to 36 inches wide. Precision built drill head with antifriction bearings together with guide support which is adjustable vertically to position drill and reamer guide bushing close to top of work insures tolerance accuracy. Extra large bearing area on drill near assembly base assures the travel at exactly 90 degrees on two accurately ground ways across solid bridge.

Full-size table provides complete support for work to assure accuracy. Work is securely clamped to the long slide rail which moves the work left

HIGH PRODUCTION
HIGH PRECISION

SHUSTER *Automatic*
SLIDE FEED MACHINE



Straighten and Cut Round or Shaped Stock Short Lengths

Recommended wherever accuracy and a perfectly square cut are a "must." In this machine, the stock receives a shearing cut from two round dies. This method of cutting produces an accurately square cut and holds the length of cut to very close tolerances.
Capacity: $\frac{1}{2}$" to 10" lengths; maximum diameter of rod, 9 16"; production, 125 pieces per minute. May be had without the 12-roll straightener if your stock is already straightened.
Detailed circulars on request. When writing please describe your set-up.

Mfd. by **METTLER MACHINE TOOL, INC.**
132R Lawrence St. New Haven, Conn.
Representatives in all principal cities and in foreign countries.

is your wiring like a camel's back?

9 out of 10 wiring systems are overloaded

That next piece of equipment you install may be the straw that breaks the back of your plant wiring system—if that wiring is inadequate and obsolete.

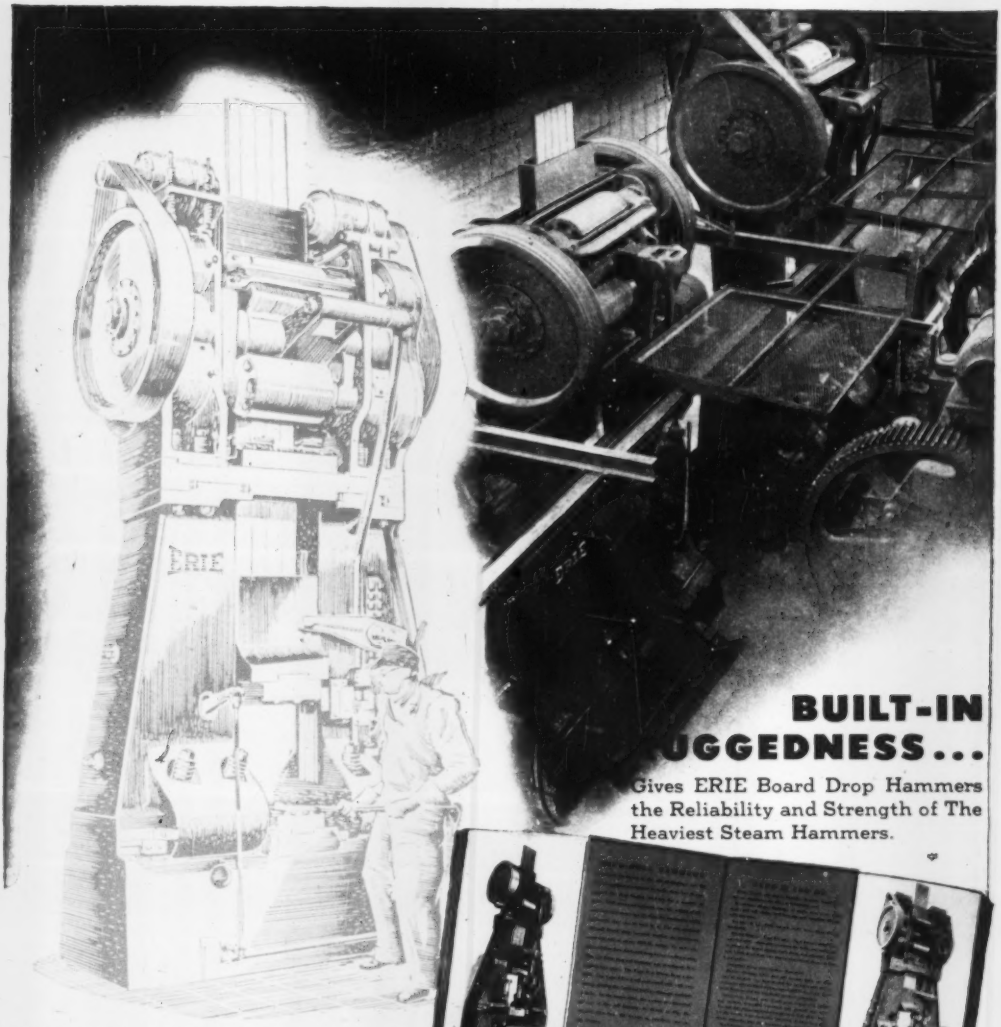
Inadequate wiring systems cost money. Every day they're causing cable failures, voltage drops and slowed production in 9 out of every 10 industrial plants. A modern wiring system gives you the full power you pay for . . . and protects you against possible power breakdowns.

Safeguard your production. A strong national defense requires full-scale production and modern up-to-the-minute power wiring systems that can deliver full power.

Make plans to survey your plant wiring system. Call in your utility, plant or consulting engineer or electrical contractor today. And by all means send for your free copy of *"Power Up—And Be Prepared."* It's a complete guide to modern plant wiring. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

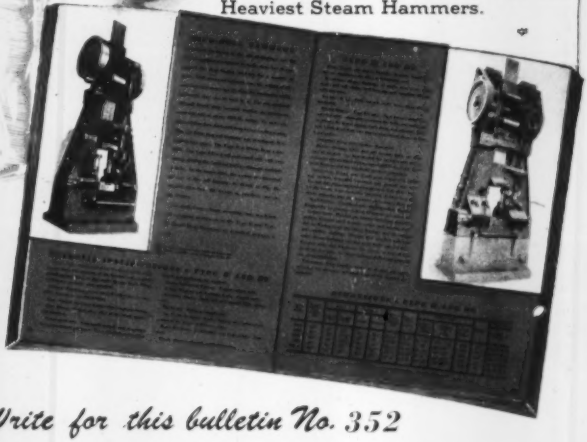
the right cable for the job **ANACONDA®**

WIRE AND CABLE



BUILT-IN
UGGEDNESS...

Gives ERIE Board Drop Hammers the Reliability and Strength of The Heaviest Steam Hammers.



Erie Board-Drop Hammers . . .
Rated from 400 to 10,000 lbs. . .
All parts subject to impact —
upper works, frames, anvil are steel.

ERIE

Write for this bulletin No. 352

ERIE FOUNDRY COMPANY · *Erie, Pa., U. S. A.*

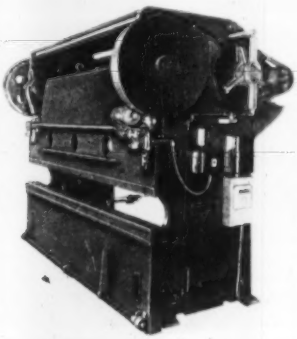
ERIE BUILDS *Dependable* **HAMMERS**

to right under the drill head. Movement of the work is provided by antifriction ball roller inserts located over the entire table area. Handwheel controlled two speed gearing provides rapid traverse for rough positioning and slow speed for locating the drill head on the bridge and locating the work clamped to the slide rail under the drill head. Air clamp levers rigidly lock both drill head and slide rail in exact position.

Check No. 11 on Reply Card for more Details

Accurate Forming, Coining

A line of press brakes is being added by Struthers Wells Corp., Titusville, Pa. Model illustrated is the 8-foot 100-ton machine equipped with extra large clutch and brake for instantaneous stopping of ram at any desired position. Ram can be positioned accurately by pushbutton control with each connecting screw provided with a micrometer adjustment and scale indicator.



Accurate forming and coining operation with deflection held to a minimum are afforded by patented construction which includes an extra heavy steel press frame, eccentrics carried on two large bearings each of which is backed against the frame and a power push line held along a straight line almost entirely within the press frame. Clutch is a single plate low pressure type easily adjusted from the outside. Band type brake is self-energizing. Either clutch or brake may be removed without dismantling any other part.

Check No. 12 on Reply Card for more Details

Heat Without Contamination

Heater consisting of a stainless steel outer shell with expansion section and an Inconel center tube with integrally welded extended surface nickel fins is made by Brown Fintube Co., Elyria, O. The equipment is

Holcroft furnace for carbo-nitriding bulk-loaded automotive parts. Has automatic quench and draw.

CARBO-NITRIDING

A Superior Case-Hardening Process

Developed by HOLCROFT

CARBO-NITRIDING provides a "gas cyanided" case by heating the work in a controlled atmosphere composed of generator gas, hydrocarbon gas and ammonia. This Holcroft process uses continuous-type furnaces such as the unit shown above, and offers these advantages:

1 Low operating cost—often as low as one-fourth that of liquid cyaniding.

2 Superior wear resistance—greater than with carburizing.

3 Greater depth of hardenable case obtained per unit of time than by carburizing at the same temperature.

4 Minimum distortion through low-temperature operation and slow cooling when required.

5 Applicable to both plain carbon and alloy steels.

Although the theory behind carbo-nitriding is mentioned in a patent issued in 1883, it was not applied to high-production furnaces until rediscovered independently by Holcroft & Company in 1936. The first furnaces of this type, built 15 years ago, are still in operation; many other production furnaces installed since then have further proven the merits of this process.

You, too, can take advantage of this metallurgical leadership. Write today for complete information.

BLAZING THE HEAT TREAT TRAIL

SINCE 1916 Holcroft AND COMPANY

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

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EUROPE — S. O. F. I. M., Paris 8, France

MALLEABLE IRON GRINDING

Electro High Speed Grinding Wheels Save Dollars in Grinding Malleable Iron

Here are the Results in pounds of METAL REMOVED

Electro SINCE 1909

HIGH SPEED WHEELS FOR SNAGGING CUTTING-OFF TOOL ROOM AND CYLINDRICAL GRINDING for Swing Frame, Floor Stand, Bench Stand and Portable Grinding Machines

GRINDING WHEEL MANUAL 645 and Speed Calculator FREE ON REQUEST

The improved grain-holding resin bond in Electro High Speed Grinding Wheels, engineered to the job in hand, are two reasons for efficiencies 45% above competitive wheels. • Operating results show: 153 lbs. of metal removed while competitive wheels averaged only 105 lbs. under identical conditions. In grinding from 24" to 20" diameter Electro removed 6.8 lbs. of metal per cubic inch of wheel and 10.4 lbs. per hour. • Here's a 45% saving which holds regardless of size of annealed malleable castings. Comparable records apply to this and all other Electro wheels. • All we ask is opportunity to prove Electro's higher efficiencies in your plant on your work. No obligation. Write, phone or wire.

Electro Refractories & Abrasives Corporation

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HIGH SPEED *Electro* RESIN BONDED GRINDING WHEELS

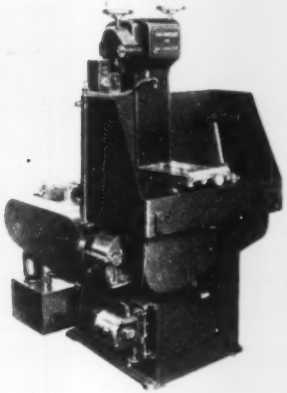
WEST COAST WAREHOUSE, LOS ANGELES 58, CAL. • ELECTRIC FURNACE PLANT for SILICON CARBIDE MANUFACTURE, CAP-DE-LA-MADELEINE, P. Q., CANADA

designed to heat air, special atmospheres, gases or liquids without contaminating them with the products of combustion. Temperature ranges to 1600° F. from atmospheric to high pressures are possible. Heaters can be controlled accurately within close limits and use either oil or gas as fuel.

Check No. 13 on Reply Card for more Details

Cool Grinding

Model V8-WP, an 8-inch wet abrasive belt grinder, is announced by Hammond Machinery Builders Inc., Kalamazoo, Mich. It features a patented power reciprocating table with tilting work-holder and a water cooled belt platen. Table travel is adjustable from zero to 8 inches and the stroke



speed back and forth across the abrasive belt can be varied to suit the work being done.

Design of the water-cooled platen makes it possible for the downward pull of the abrasive belt to create a continuous film of coolant between the back of the belt and the entire face of the plate. This feature eliminates distortion of both work and platen usually caused by heat. Coolant system employs two coolant tanks with a combined capacity of 35 gallons.

Check No. 11 on Reply Card for more Details

Weight Balance Milling

A machine for manufacture of interchangeable automotive connecting rods entailing a final operation of machining each end to weight balance within 2 grams is being produced by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, O., in co-operation with Toledo Scale Co. Unit consists of two opposed special quill type stationary

for

BORON STEELS

WITH FINE GRAIN SIZE

USE *Grainal* ALLOYS

Grain growth inhibitors in metallurgically determined amounts are included . . . in addition to boron . . . among the elements composing Grainal alloys.

Because of the beneficial influence of these additional elements, boron steels made with Grainal alloys maintain finer grain size at higher temperatures than is the case of boron steels made without inhibitors.

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MAKERS OF ALLOYS

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CHEMICALS AND METALS

Tool Saving Tips #3 OF A SERIES

USE KENNAMETAL MECHANICALLY HELD TOOLS

SAVE STEEL
Solid heat-treated shank resists chip erosion —serves as permanent tool holder

SAVE INVESTMENT
Tool is suitable for cutting variety of metals by using insert of proper Kennametal grade

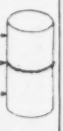
SAVE GRINDING WHEELS
Grinding is simpler—less frequently required. No steel to grind

SAVE CARBIDE
Mechanical-holding prevents brazing strains —insures best service from Kennametal

SAVE "CRITICALS"
The mechanically held technique enables you to get the best possible service from all tooling elements, thereby conserving materials, machine-time, and man-hours

HOW TO S-T-R-E-T-C-H KENNAMATIC INSERTS

When Kennametal inserts have been reground many times and have become too short for effective clamping, simply braze two "used" pieces end to end as shown. This permits proper clamping . . . and because Kennametal inserts are uniformly sound from top to bottom you get much more work from each insert.



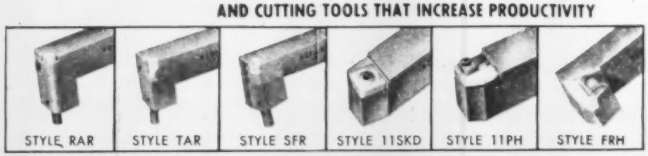
The ruggedness, strain-free assembly, and convenience of mechanically-held Kennametal tools enable them to do many jobs that brazed tools cannot do . . . or to do them faster at less cost.

Standard Kennametal tools will handle the majority of these jobs . . . and the basic principles of their design are adaptable to a wide variety of special purpose clamped tools which can be made in your own shop. To assist you we have published a "Clamped Tool Design Manual." Write for a free copy.

Our nearest field engineer can help you use clamped tools most effectively. He represents our organization which pioneered the mechanically-held principle . . . offers you the greatest accumulation of tool-and-time-saving "know-how" available through one source.

KENNAMETAL *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY



milling heads and a hydraulically actuated clamping fixture mounted on hardened ways between the heads with all units mounted on a heavy, normalized, welded steel base. The Toledo Scale unit is contained in a floor-mounted cabinet positioned at right angles to the machine within easy reach of the operator.

To start the cycle the operator places an overweight connecting rod on the scale unit where each end is individually weighed about the fixed center of gravity and the amount of overweight mechanically transmitted to

the machining unit. The connecting rod is then placed in the fixture of the milling machine and the cycle button pressed. Locating probes and quills of both milling heads advance with locating probes stopping against the work with the milling head quills advancing the additional amount necessary to remove a sufficient amount of metal from each end to bring the connecting rod within weight balance. Milling heads are then locked and the fixture slide is rapid traversed to the milling cutter and fed at milling rate to remove extra stock.

Check No. 15 on Reply Card for more Details

Paint Deflocculator

Skimeze, a concentrated semipaste deflocculator compounded for zinc chromate, P-27 primer, alkyd resin primers, varnish and chassis black primer, is offered by Kelite Products Inc., Los Angeles 54, Calif. It is added to the spray booth solution and as it is nearly neutral in pH, paint can be reclaimed.

Check No. 16 on Reply Card for more Details

Boiler and Metal Protector

Corrosanti, a boiler and metal protector, is introduced by Research Laboratories of Dr. Schror Inc., East Orange, N. J. It is made in four grades: Grade A, for the protection of boiler metal surfaces, removes all boilers' scale deposits, prevents rust, pitting and corrosion. Grade B is a rust inhibitor for water tanks and towers, open air condensers, catwalks, etc. Grade C will protect metal surfaces subjected to acid and other highly corrosive vapors, gases, acid-

Exide-Ironclad
BATTERIES

ARE YOUR BEST POWER BUY— AT ANY PRICE

They ASSURE high maneuverability of trucks . . . rapid, accurate handling of material. PROVIDE uniform rate of material handling with no unscheduled down time. SHOW lowest costs of operation, maintenance, repair, depreciation . . . inherently safe. Call in an Exide representative, and let him prove these facts.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

forming conditions. Special is for ferrous surfaces subjected to temperatures of 900 F such as smokestacks, flues, locomotives, etc.

Check No. 17 on Reply Card for more Details

Steadies Ladder

Hydra-Lizer, an adjustable steel attachment for the lower end of straight or extension ladders, is introduced by Mine Safety Appliances Co., Pittsburgh, Pa. It provides safe footing for ladders in places where the two legs would not be on the same level and can be used on any surface regardless of contour.

Check No. 18 on Reply Card for more Details

Motor Starters

Feature of the CY-2 motor starter, made by Clark Controller Co., Cleveland 10, O., is the combined use of strong multiturn magnetic blowouts with twin break contacts. A steel case, enclosing each arc chamber, carries the flux. No carbonizing of insulating material can occur because all parts in the arc chamber are copper, brass and steel.

Check No. 19 on Reply Card for more Details

Hook-On Power Factor Meter

A new hook-on power factor meter which permits direct measurement of power factor without cutting conductors or interrupting electrical service is announced by General Electric's Meter and Instrument Divisions, Schenectady 5, N. Y. Type AK-3 meter may be used on any balanced three-phase circuit and gives direct power-factor readings in circuits with voltages ranging from 100 to 600 v and currents from 15 to 600 amp.

Check No. 20 on Reply Card for more Details

Caps for Pigtail Splicing

For pigtail splicing of electrical wires, splice caps are available from Buchanan Electrical Products Corp., Hillside, N. J., in an improved open-end construction. This insures that wire insulation is always flush with splice cap for maximum circuit protection and that wires are always inserted to full depth of cap for maximum joint efficiency.

Check No. 21 on Reply Card for more Details

Rust-Proofing Process

Perm-Cote, a new phosphate coating material developed by Detrex Corp., Detroit 32, Mich., is recommended for metal fasteners, springs, hand tools, sheet metal parts, etc. When immersed in the solution, iron and steel surfaces are chemically converted into a dark gray, uniform, dense, nonmetallic phosphate coating. After rinsing, the absorbent coating is impregnated with a rust-proofing oil, Perm-Oil, that gives the products a permanent corrosion-proof layer that is dry to the touch.

Check No. 22 on Reply Card for more Details

Double Head Welding Head

A new double head bench welding head is announced by Federal Tool Engineering Co., Newark, N. J. Pressure is applied through a cam acting against the variable deflection of a cantilever spring. Combination of cam and cantilever spring is arranged to provide automatic follow through pressure instantaneously. There are independent switches and an independent treadle for each pair of electrodes.

Check No. 23 on Reply Card for more Details

Cap Electrode

Nu-Wrinkle cap electrode is introduced by P. R. Mallory & Co. Inc., Indianapolis, Ind. It consists of a reusable shank and a replaceable cap. A corrugated skirt provides positive electrical and thermal contact with the shank while the fluted water hole in the shank assures maximum cooling efficiency. It is available in all the company's standard nose shapes in Elkaloy A and Mallory 3 metals.

Check No. 24 on Reply Card for more Details

Explosion-Proof Controls

Simplytrol automatic controls are available from Assembly Products Inc., Chagrin Falls, O., in explosion-proof housings for use in locations where there is a hazardous atmosphere. These instruments can be used to control any process or condition that can be measured by an electric meter.

Check No. 25 on Reply Card for more Details

Torque Analyzer

Designated as senior No. 500 D, a torque analyzer for powered torque tools is announced by Richmont Inc., Los Angeles 23, Calif. It measures torque power from 5 to 500 foot-pounds and the tension produced by nut and bolt assemblies with a range from 100 to 50,000 pounds.

Check No. 26 on Reply Card for more Details

Electrode Holder

Position of the jaws of the new electrode holder introduced by Cam-Lok Division, Empire Products Inc., Cincinnati 36, O., eliminates rod bending and makes welding in cramped spaces easier. There are no coil springs in the operating mechanism which is enclosed and protected by the insulation. Holder is available in three sizes: Heavy duty, 500 amp; general purpose, 300 amp; light duty, 200 amp.

Check No. 27 on Reply Card for more Details

Foot Switch with Safety Device

Linemaster Lektro-Lok foot switch, developed by Simonds Machine Co. Inc., Southbridge, Mass., has a mechanical interlock that prevents both circuits from being operative at the same time. Both interiors can be wired normally open or normally closed.

Check No. 28 on Reply Card for more Details

Dust Cups

F. J. Stokes Machine Co., Philadelphia 20, Pa., offer neoprene dust cups for rotary tabletting machines. They attach to each upper punch and catch running oil or grease on the punch shank and keep it from falling into the granulation. They also prevent dust from puffing up from the point of compression and gathering on lower shank or keyway.

Check No. 29 on Reply Card for more Details

Tests Frequency Response

Panoramic Radio Products Inc., Mt. Vernon, N. Y., is offering a new sonic response indicator, model G2, to be used as an adjunct to the company's sonic analyzer, model AP-1. The G2 may be used for research, development or production line testing of the frequency response characteristics of amplifiers, filters, transmission lines and receivers.

Check No. 30 on Reply Card for more Details

Welding Head

Model I-S Weldpower welding head, offered by Raytheon Mfg. Co., Waltham 54, Mass., is a bench mounted, press type unit with single post mounting. It is for welding dissimilar metals in the assembly of small metal parts. Accurate electrode pressure is possible through the use of a closed air system using a metal bellows and instantaneous electrode follow-up is achieved by keeping mass of moving parts of upper electrode assembly extremely low.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

74. Conveying Systems

Maguire Machinery Co.—8-page illustrated bulletin No. W-1049 shows how to effect operating and labor economies through use of conveying systems in production operations. Chief components of individual systems are discussed and advantages of prefabricated units listed.

75. Self-Tapping Screws

Parker-Kalon Corp.—24-page illustrated pocket-size booklet No. 480 contains information on self-tatpping screw selection, application data, recommended hole sizes and corresponding drill size numbers.

76. Refractories & Insulations

Refractory & Insulation Corp.—Illustrated catalog shows where, when and how to use refractory and insulating materials of various types in industrial heat processing and heat generating equipment.

77. Titanium Alloy

Kennametal Inc.—4-page illustrated bulletin 1050 offers technical information on Kentanium heat resistant titanium alloy which resists thermal shock, withstands oxidation and retains its strength at temperatures of 1800° F and above.

78. Electric Motors

Wagner Electric Corp.—4-page illustrated bulletin MU-94 gives horsepower ranges of capacitor and induction start single-phase motors and open type squirrel-cage, explosion-proof, totally-enclosed, cast iron frame and totally-enclosed fan-cooled steel frame polyphase motors.

79. Welder's Equipment

Willson Products, Inc.—Protective equipment for welders is described in 4-page illustrated bulletin 3-51 which covers eye protective devices for both gas and arc welding. Selector chart aids in selection of proper type and shade of filter glass to use for different welding operations.

80. Shaping Machines

Klingelhofer Machine Tool Co.—4-page illustrated folder describes model 850H Klopp full hydraulic high speed shaping machines, speed of which is variable in operation. Machine has 26-in. stroke length and cutting speed ranges of 26-90 and 90-138 fpm.

81. Foundation Grouting

Master Builders Co. — Procedures for grouting foundations of machinery, engines and equipment are explained in detail in 16-page illustrated bulletin E-1b. Data are given on Embco grouting which is nonshrinking and provides fast hardening, ductile, and oil and water resistant grouts. Recommended mixes and estimating table are included.

82. Metal Disintegrator

Clinton Machine Co., Warner Div.—8-page illustrated bulletin describes operation of model CX metal disintegrator that is capable of cutting 0.155-in. holes through ¼-in. Carboloy in 5 min. Various applications such as cutting oil holes in hardened gears and removing broken tools are covered. Unit can also be used for arc welding, brazing, soldering, drill pulling, air extraction, etching and magnetizing and demagnetizing.

83. Tool Room Furnaces

Surface Combustion Corp.—4-page illustrated bulletin SC-151 describes controlled atmosphere furnaces and generators as well as direct fired, forced convection and pot furnaces designed for precise heat treatment of tool steels.

84. JIC Pneumatic Standards

Miller Motor Co.—"JIC Pneumatic Standards for Industrial Equipment" is title of 12-page illustrated bulletin which contains sample circuits, glossary of terms, standard symbols and other data. How Miller air cylinders comply with JIC standards is shown.

85. Reciprocating Pump

Aldrich Pump Co.—6-page illustrated bulletin No. 64 A depicts and describes 3-in. stroke direct-flow triplex pump which is suitable for chemical handling, hydraulic systems and oil field service. Design features, dimensional drawings and performance data are given.

86. Decimal Equivalents

Johnson Bronze Co.—8½ x 11-in. wall chart tabulates decimal equivalents to four places for fractions from 1/64 to 1 in. in increments of 1/64. Also pictured are general purpose, electric motor and cast bronze graphited bearings and universal bronze bars.

87. Rolling Mill Lubrication

E. W. Bliss Co.—20 page illustrated booklet "Bliss Rolling Mills Lubrication data" covers lubricating methods for hot and cold rolling mills and accessory machinery for steel, aluminum and brass plants. Published with assistance of Socony-Vacuum Oil Co., it presents advantages and limitations of various systems and has chart of specific recommendations for lubrication of all mill components.

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HELPFUL LITERATURE

88. Combination Milling Tool

Versa-Mil Co.—24-page illustrated bulletin No. 8 explains how precision milling, boring and grinding can be obtained by Versa-Mil combination milling tool accessory that can be combined with machine tools or work-holding fixtures for use in production machining as well as in maintenance and experimental shops.

89. Hand Lift Trucks

Barrett-Cravens Co.—24-page illustrated bulletin No. 5141 depicts and describes hydraulic hand lift trucks ranging in capacity from 1000 to 15,000 lb. Features of these trucks include long Alemite-greased bearing surface the entire width of truck, single-stroke lift capacity increased 25 per cent, spring handle hold-up and positive engagement of handle latch and lifting lever.

90. Air Tools

Rotor Tool Co.—44-page illustrated bulletin No. 38 depicts and describes various air-operated tools for foundry, steel mill, production line and assembly plant application. Shown in typical applications are screw drivers, nut setters, sanders, drills, grinders, rammers, chippers and scalers.

91. Motor Protection

Westinghouse Electric Corp.—12-page illustrated booklet DB-4673 explains interlinked protection of circuits, motors and personnel. High voltage combination-starter booklet stresses three-way protection for squirrel-cage, synchronous, wound-rotor and multispeed motor installations. Three types of combination motor starters and type BAL fuse, a component of each starter, are covered.

92. Casting Grip

Joy Mfg. Co.—Class CG-2 Casting Grip described in 2-page illustrated bulletin 76-M is pneumatic device which holds 2 to 20-in. castings firmly regardless of shape. It facilitates cleaning and snagging operations and assures safety to workman.

93. Furnace Controls

Minneapolis-Honeywell Regulator Co., Brown Instruments Div.—4-page illustrated bulletin No. 5.2-2 covers both electric and pneumatic systems for control of continuous hardening furnaces of either gas or electric fired type. Specifications are included for standard systems as well as many options for special cases.

94. Straightening Machines

Medart Co.—16-page illustrated bulletin No. SS50 deals with various types of shape straightening machines engineered for straightening shapes produced by ferrous and nonferrous mills throughout the country. Included are engineering data table and outline of the theory of shape straightening.

95. Refractory Products

Illinois Clay Products Co.—4-page illustrated folder on Goose Lake refractories gives information on fire clay brick and flour, ground and screened fire clay and silica mix for cupola patching. Information on Grundite bond clay is included.

96. Electric Oil Heaters

Hauck Mfg. Co.—4-page illustrated catalog No. 709 lists various types of electric oil heaters for efficiently heating heavy grades of fuel oil with automatic control of oil temperature. Suction type heater is used to maintain oil at proper temperature for pumping, and preheater heats oil from pumping temperature to higher temperature usually required at burner for proper atomization.

97. Heat Treating Furnaces

Surface Combustion Corp.—4-page illustrated bulletin SC-152 "Surface Heat Treating Furnaces for the Aircraft Industry" has sections devoted to steel tubing and assemblies, aluminum and light metal assemblies, jet and reciprocating engine parts, propeller blades and miscellaneous aluminum forgings.

98. Power Saws

Peerless Machine Co.—8-page illustrated bulletin FL-58-A "Peerless Products for Industry" details various power saws, with and without bar feed, of Hydra-Cut, Mechani-Cut, standard and heavy duty vertical types. Capacities range from 6⅝ x 6⅝-in. to 18 x 18 in.

99. Metal Working Presses

American Steel Foundries, Elmes Engineering Div.—12-page illustrated bulletin No. 1010-B depicts and describes hydraulic metalworking presses. Presses feature electric control that provides semiautomatic or automatic operation and inching with speed change and reversal of slide governed either by ram travel or pressure.

100. Electric Power Units

Ready-Power Co.—Gasoline, gas or diesel engine driven electric generator units which provide reliable source of power for continuous or stand-by service are covered in 8-page illustrated bulletin 263-2. These self-contained units are ready for installation, are powered with International Harvester engines and are offered in direct and alternating current types.

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11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
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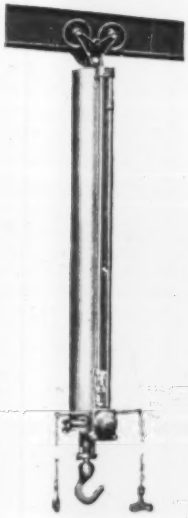

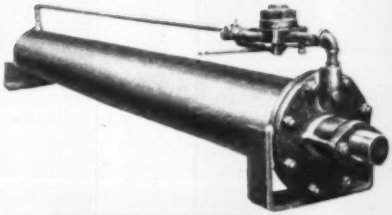

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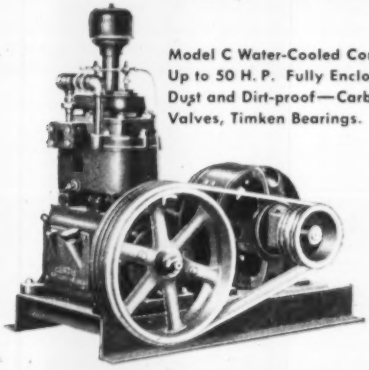

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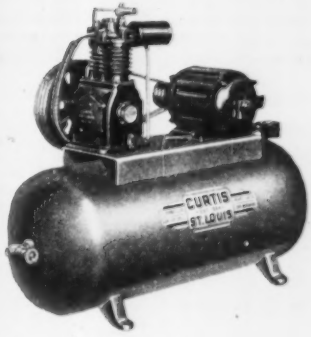

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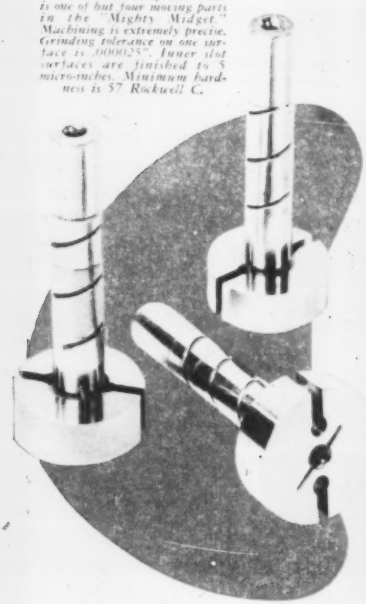
Seeger engineers and Republic Field Metallurgists studied the processing of the alloy steel rotor for the "Mighty Midget" —the efficient, compact compressor which powers Seeger domestic refrigerators and home freezers. Together they agreed on revised cold drawn alloy steel bar specifications and process modifications.

Then Republic's Union Drawn Steel Division, working to structure rather than hardness, modified its steel processing to achieve specific machinability requirements. For uniform heat treating results, a guaranteed hardenability alloy steel was recommended, with carbon correction advised for maximum wearing conditions. Heat treating equipment was adjusted.

The results: more might for the "Mighty Midget," plus substantial material and time savings. Time now to take a long look at your own products and processes? This same 3-Dimension Metallurgical Service is freely available to all alloy steel users. It's completely confidential and without obligation. Just write:

This alloy steel compressor rotor is one of but four moving parts in the "Mighty Midget." Machining is extremely precise. Grinding tolerance on one surface is .0000/25". Inner slot surfaces are finished to 5 micro-inches. Minimum hardness is 57 Rockwell C.



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The Market Outlook

PEACE feelers in the Korean war are causing no noticeable easing in demand pressure on the steel mills as yet. The latest Russian move on the diplomatic front, however, is not without effect on trade sentiment. Somewhat more cautious view of the outlook is being generated by Soviet Deputy Foreign Minister Jacob Malik's "cease fire" proposal despite widespread skepticism of its sincerity. If nothing else, it is adding to the uncertainty prevailing in the markets for some time. Until it is clearly established Malik is not just "throwing dust in our eyes" this uncertainty is likely to intensify the confusion attending switchover of steel distribution to the Controlled Materials Plan.

DEMAND—No matter what the turn of events in Korea, strong demand for steel indefinitely into the future appears assured by the promise of continued large-scale defense preparations. Nevertheless, it is recognized that should the fighting in the Far East suddenly end, some easing in procurement tension might likely follow, barring outbreaks in other parts of the world such as now threatens in Iran. How severe, or prolonged, such easing would be is anyone's guess at this juncture. But most trade authorities feel any letdown would be short-lived in the absence of an about-face by Soviet Russia in her relations with the free world, a course not even faintly hinted in any Russian moves to date.

SLOWING DOWN—Looking at the steel trade picture from another angle, actual slowing down in demand and production is anticipated over the next few weeks. Beginning this week, closing of numerous plants, or curtailing of operations, for vacations will be in evidence. Some curtailments are being occasioned by steel shortages arising from mandatory cutbacks in supplies under government control regulations. A number of automobile plants are in this latter category. In the main, however, curtailments are largely because of vacations, and it is significant such suspensions are not as widespread or as extensive as a year ago. Some of those consumers closing shop for one or two weeks are suspending raw materials intake. Others are continuing to take in steel and other materials right through the layoff period. Impact of vacations will be particulary noticeable this week, this being a favorite holiday season with workers generally.

PRODUCTION—The steel mills continue to pour out tonnage in record volume. So far this year all previous weekly, monthly, quarterly and half-yearly peaks have been topped. More than 52 million tons were produced in the first half of the year. Since the outbreak of the Korean war more than 104 million tons of steel have been turned out by the mills. Continuance of the present high production pace should result in production of about 106 million tons in 1951. Currently the national ingot rate is booming along at 103 per cent of capacity, equal to weekly output of 2,060,000 net tons. Indications are, however, some slackening from this pace will be experienced because of vacations and repairs. Excessively warm weather also may adversely affect output.

CONTROLS—Consumers are being urged to convert their DO-rated orders on mill books to Controlled Materials Plan status as quickly as possible. Last week, in a move to minimize disruption of steel mill scheduling as far as possible in the transition to CMP, the National Production Authority issued direction 1 to CMP Regulation 3 postponing from July 1 to July 7 the date on which authorized controlled materials orders will take precedence over DO-rated orders calling for delivery of steel, copper and aluminum during September. In this same direction, it is stipulated that no prime consumer may order for delivery in any one month more than 35 per cent of the steel, copper or aluminum authorized in its quarterly allotment.

PRICES—Steel and related product prices hold at the January freeze levels. STEEL's weighted index on finished steel is steady at 171.92.

NATIONAL STEELWORKS OPERATIONS

DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended June 30	Change	Same Week 1950	Same Week 1949
Pittsburgh	101.5	+ 0.5*	100	76.5
Chicago	106	+ 1.5*	102.5	92.5
Mid-Atlantic	102	0	98.5	74
Youngstown	105	0	107	90
Wheeling	98.5	0	100	70.5
Cleveland	100.5	- 1.5	70	85.5
Buffalo	104	0	104	85
Birmingham	100	0	100	100
New England	87	+ 2	90	30
Cincinnati	97	- 3	102	99
St. Louis	99	+ 7	89	83
Detroit	106	+ 7*	109	106
Western	105	- 3	99	81.5
Estimated national rate	103	0	102	80

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 37 Production-Engineering News—p. 73

Composite Market Averages

	June 28 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av. = 100)	171.92	171.92	171.92	156.69	111.86
Index in cents per lb.	4.057	4.057	4.057	3.698	2.639
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.36	$64.45
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	46.47	29.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	26.50
Malleable Pig Iron, GT	53.27	53.27	53.27	47.27	26.79
Steelmaking Scrap, GT	44.00	44.00	44.00	37.50	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	June 28 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.20	3.98	2.82
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.91	3.91	3.91	3.46	2.465
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv. Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.25-50	2.55
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.55-5.35	4.55-5.35	4.55-5.35	4.15-50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35-5.60	4.35-5.60	4.35-5.60	4.35-90	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.03
Nails, Wire, Pittsburgh	5.00-6.20	5.00-6.20	5.00-6.20	5.20	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ½"-⅝", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$27.00
Basic, Valley	52.00	52.00	52.00	46.00	26.00
Basic, del. Phila.	56.46	56.46	56.46	49.44	27.84
No. 2 Fdry., Pitts.	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry., Valley	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry., Del. Phila.	56.99	56.99	56.99	48.94	28.34
No. 2 Fdry., Birm.	48.88	48.88	48.88	42.88	22.88
No. 2 Fdry., Birm. del. Cin.	55.33	55.33	55.33	48.08	25.94
Malleable Valley	52.50	52.50	52.50	46.50	26.50
Malleable, Chicago	52.50	52.50	52.50	46.50	26.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt., Pitts.	$45.00	$45.00	$45.00	$41.00	$20.00
No. 1 Heavy M&S, E. Pa.	43.50	43.50	43.50	41.00	18.75
No. 1 Heavy Melt, Chicago	43.50	43.50	43.50	37.50	18.75
No. 1 Heavy Melt, Valley	45.00	45.00	45.00	41.50	20.00
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	39.50	19.50
No. 1 Heavy Melt, Buffalo	44.00	44.00	44.00	39.50	19.25
Rails, Rerolling, Chicago	52.00	52.00	52.00	47.00	22.25
No. 1 Cast, Chicago	49.00	49.00	49.00	45.00	20.00

* F. o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.25	$7.50
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	16.50	9.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	15.00	9.25
Lead, St. Louis	16.80	16.80	16.80	16.80	8.10
Tin, New York	106.00	106.00	136.00	78.25	52.00
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid	36.00	36.00	36.00	18.00	35.00

Pig Iron

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$56.50
Brooklyn, N.Y., del.	....	58.69	58.48	....
Newark, del.	56.74	57.24	57.74	58.24
Philadelphia, del.	56.49	56.99	57.49	57.99
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	61.63	62.13	62.63	....
Rochester, N.Y., del.	54.74	55.24	55.74	....
Syracuse, N.Y., del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon, Mich., del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	51.75	52.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	*52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.35	....	....
Portland, Oreg., del.	....	60.35	....	....
Los Angeles, San Francisco, del.	59.85	60.35	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.96	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N. & S. sides, Ambridge, Aliquippa, del.	....	53.74	53.74	54.24
McKees Rocks, del.	....	53.48	53.48	53.98
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.00	54.00	54.50
Verona, del.	....	54.48	54.48	54.98
Brackenridge, del.	....	54.72	54.72	55.22
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.43	56.93	56.93	57.43

*Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo, H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb pigiets, 16% Si, frt. allowed K2	93.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.12
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, June 28, 1951, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $79.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R7 ... $54.00
Fontana,Calif. K1 ... 80.00
Houston,Tex. S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 75.00
Gary,Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 69.00
Ensley,Ala. T2 ... 66.00
Fairfield,Ala. T2 ... 66.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 66.00
Geneva,Utah G1 ... 66.00
Houston,Tex. S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 85.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 85.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O. (29) T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 89.00
Gary,Ind. U5 ... 70.00
Houston,Tex. S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00
Lackawanna,N.Y. B2 ... 70.00
LosAngeles B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 103.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $89.00

SKELP
Aliquippa,Pa. J5 ... 3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown R2, U5 ... 3.35

WIRE RODS
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston,Tex. S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
No.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So.Chicago,Ill. R2 ... 4.10
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(1) N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah G1 ... 3.65
Houston,Tex. S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22) P1 ... 4.85
Phoenixville,Pa. P4 ... 4.95
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.55
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa.(14) B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana,Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah G1 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Ind.Harbor,Ind. Y1 ... 6.00
Johnstown,Pa. B2 ... 5.50
Lackawanna,N.Y.(14) B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So. Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland J5, R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.65
Fontana,Calif.(30) K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah G1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.65
Seattle B3 ... 6.55
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Struthers,O. R2 ... 5.65
Youngstown Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. L7 ... 5.25
Conshohocken,Pa. A3 ... 5.05
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Harrisburg,Pa. C5 ... 5.95
Ind.Harbor,Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago,Ill. U5 ... 4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ... 3.95
Ashland,l.c.l.(15) A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky.(15) A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. L7 ... 4.15
Conshohocken,Pa. A3 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana,Calif.(30) K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah G1 ... 3.70
Harrisburg,Pa. C5 ... 4.95
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.50
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5, W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. R2 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A. R.
Fontana,Calif. K1 ... 5.45
Geneva,Utah G1 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Alton,Ill.(1) LI ... 3.95
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.20
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
So.Chicago R2, U5, W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFran.,Cal. B3 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.85
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ... 3.70
Atlanta A11 ... 4.25
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.65
SanFrancisco S7 ... 4.95

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(29) T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.35
Gary,Ind. U5 ... 4.30
Houston,Tex. S5 ... 4.70
Ind.Harbor,Ind. I-2, Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
KansasCity,Mo. S5 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2,U5,W14 ... 4.30
So.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary,Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.55
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif. K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.55
BeaverFalls,Pa. M12,P2 ... 4.65
Buffalo B5 ... 4.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 4.55
Chicago W18 ... 4.55
Cleveland A7, C20 ... 4.55
Detroit P17 ... 4.70
Donora,Pa. A7 ... 4.55
Elyria,O. W8 ... 4.55
FranklinPark,Ill. N5 ... 4.55
Gary,Ind. R2 ... 4.55
GreenBay,Wis. F7 ... 4.55
Hammond,Ind. L2, M13 ... 4.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 4.55
LosAngeles R2 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 4.55
Monaca,Pa. S17 ... 4.55
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 4.80
Pittsburgh J5 ... 4.55
Putnam,Conn. W18 ... 5.10
Rockville,Conn. C14 ... 5.10
St.Louis,Mo. M5 ... 4.95
So.Chicago,Ill. W14 ... 4.55
SpringCity,Pa.(5) K3 ... 5.00
Struthers,O. Y1 ... 4.55
Waukegan,Ill. A7 ... 4.55
Youngstown F3, Y1 ... 4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.80
Canton,O. R2 ... 5.40
Canton,O.(29) T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Cleveland C20 ... 5.40
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. L2, M13 ... 5.40
Hartford,Conn. R2 ... 5.85
Harvey,Ill. B5 ... 5.40
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2, R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Whitehall,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.50
Franklin,Pa.(3, 4) P5 ... 4.75
PortWorth,Tex.(26) T4 ... 4.85
Huntington,W.Va. W7 ... 5.50
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 3.80
Tonawanda,(3,4) B12 ... 4.75
Williamsport(3) S19 ... 5.00
Williamsport(4) S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt) U1 ... 15.00
Dover,(Eng.Bolt) U1 ... 13.50
Dover(Wrgt.Iron) U1 ... 12.25
Economy,Pa. (S.R.) B14 ... 9.60
Economy,Pa. (D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt) L5 ... 14.50
McK.Rks.(S.R.) L5 ... 9.60
McKRks.(D.R.) L5 ... 13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Alton,Ill.(6) LI ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.20
Minnequa,Colo. C10 ... 4.35
Niles,Calif. P1 ... 5.05
Pittsburg,Calif. C11 ... 4.40
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
So.Chicago R2,U5,W14 ... 3.70
So.SanFrancisco B3 ... 4.40
Sparrows Point,Md. B2 ... 3.70
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Youngstown R2, U5 ... 3.70

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ¾-1" B2 ... 4.75
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.00
Seattle B3, N14 ... 5.55
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¾-1" B2 ... 4.75
Williamsport,Pa. S19 ... 5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.60
Ashland,Ky.(8) A10 ... 3.60
Butler,Pa. A10 ... 3.60
Cleveland J5, R2 ... 3.60
Conshohocken,Pa. A3 ... 4.00
Detroit M1 ... 4.40
Ecorse,Mich.(8) G5 ... 3.80
Fairfield,Ala. T2 ... 3.60
Fontana,Calif. K1 ... 4.55
Gary,Ind. U5 ... 3.60
Geneva,Utah G1 ... 3.70
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2,Y1 ... 3.60
Irvin,Pa. U5 ... 3.60
Lackawanna,N.Y. B2 ... 3.60
Munhall,Pa. U5 ... 3.60
Niles,O. N12 ... 5.25
Pittsburg,Calif. C11 ... 4.30
Pittsburgh J5 ... 3.60
Sharon,Pa. S3 ... 4.00
So.Chicago,Ill. W14 ... 3.60
SparrowsPoint,Md. B2 ... 3.60
Steubenville,O. W10 ... 3.60
Torrance,Calif. C11 ... 4.30
Warren,O. R2 ... 3.60
Weirton,W.Va. W6 ... 3.60
WestLeechburg,Pa. A4 ... 3.75
Youngstown U5, Y1 ... 3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover, O. R1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.60
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
IndianaHarbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35) B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.40
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.55
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.65
IndianaHarbor,Ind. I-2, ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J6, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana, Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor, Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.65
Middletown,O. A10	5.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.55
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky. (8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16 Pure Iron

	Cu	Cu
	No. 16	Alloy Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinaFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.65
Canton,O. R2	5.65

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGHTS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American 1.25 Coke (Base Box)

	lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.80
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.50
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J6	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt.Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10) S15	10.75
Pawtucket,R.I. (11) N8	10.75
Pawtucket,R.I.(12) N8	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt.Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
LosAngeles B3	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,(40) T5	4.65
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	5.25
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. A7	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
Franklin Park,Ill. T6	5.00	6.60	7.20	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
New Castle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Warren,O. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	12.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.25	12.25
Waukegan A7	10.25	12.15

ROPE WIRE

	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria, O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers, O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8,	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet, Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-sga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) NS	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR For Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Millbury,Mass.(12) N6	8.06
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SoSanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-15ga R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	208
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pitsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So.Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed

Col.	
AlabamaCity, Ala. R2	138
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	143
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop

Col.	
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill.,R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

NAILS & STAPLES, Stock
To dealers & mfrs. (7)

Col.	
AlabamaCity,Ala. R2	118
Aliquippa,Pa. (13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester, Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(37) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburgh,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. All No. 1	Std. All No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.35	4.00
Ensley,Ala. T2	3.60	3.50		4.00
Fairfield,Ala. T2				4.00
Gary,Ind. U5	3.60	3.50	3.55	
Huntington,W.Va. W7				5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	
Johnstown,Pa. B2				(16) 4.00
Lackawanna B2	3.60	3.50		4.00
Minnequa,Colo. C10	3.60	3.50		4.50
Steelton,Pa. B2	3.60	3.50		
Williamsport,Pa. S19				4.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr. Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
1½W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
1¾W,4Cr,2V	128.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C8, C13, C15, D4, F2, J3, L3, M14, S8, U4, V2, V3.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel, Div. Internatoinal Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.30c finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 0.50c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 12" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

OFFERS 5 TYPES, 18 DIFFERENT SIZES

There's a Nazel Hammer for practically every forging job.

TYPE B, LIGHT DUTY: 3 sizes work mild steel 2" square to 4" square. Base and anvil are one-piece and of cast steel.

TYPE B, HEAVY DUTY: 4 sizes work mild steel 5½" square to 11" square.

TYPE N: 3 sizes work mild steel up to 7" square, and has an externally guided ram.

TYPE I, for die forging, is built in 3 sizes up to 1500 lbs.—has an externally guided ram and the anvil is machined to fit and bolted to the base.

TYPE S, which incorporates single and rhythmic blows from any point in the stroke, works mild steel efficiently from 4½" to 13" square, depending on the size of hammer, and is available in five sizes.

Complete engineering details are contained in our Hammer Book. Write for it, today.

LOBDELL UNITED COMPANY
1836 WILMINGTON 99, DELAWARE 1951
A SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	29.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	31.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼" and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24½ on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅜"; 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv. B	Elec. Weld Black C	Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.80	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 16 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.26	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.88	31.76
2¾	12	29.65	36.32	29.57	34.76
3	12	32.11	39.33	31.33	36.84
3½	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302					19.75	27.50	77.00
304	25.00	28.00			20.75	27.50	77.00
		29.50			24.50		
309	30.50	35.00					
310	36.50	41.00					144.00
316	29.50	34.00			26.00	36.50	
		34.00					
317	34.50	39.00					
318	38.50	38.00			23.00	33.00	111.00
321	26.50	31.00			24.00	33.50	130.00
347	27.50	30.50					
		32.00					
405	21.25	27.75					
410	20.75	27.25					165.00
Nickel	33.25	44.25	41.00	54.00			
Inconel	41.00	53.50					
Monel	34.75	45.75					
Copper*			23.70†	29.63†			

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Coatesville, Pa., A3 and New Castle, Ind. 1-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point, for copper-base sheets is Carnegie, Pa., A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

	Reg. Hvy.
6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap, and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1⅛-in.	9	5
1¼-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	9.5
⅞-in.-1⅛-in.	12	2
1¼-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1⅛-in.	19.5	12
1¼-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1⅛-in.	24	15
1¼-in. & larger	13	8.5
	Light	
⅜-in. & smaller	35	
½-in. to ¾-in.	28.5	
⅞-in. to 1⅛-in.	26	

STEEL STOVE BOLTS
(F.o.b. plant; per cent off list in packages)

Plain finish	18 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS
(1020 steel, packaged; per cent off list)

6 in. or shorter:	
¾-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
¾-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
½-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam. Inches	Length	Cents per lb
17, 18, 20	60-72	17.85
8 to 16	48-60-72	17.85
7	48-60	19.57
6	48-60	20.95
4-5	40	21.50
3	40	22.61
2½	24-30	23.15
2	24-30	25.36

CARBON

40	100-110	8.03
35	100-110	8.03
30	84-110	8.03
24	72 to 104	8.03
17 to 20	34-50	8.03
14	60-72	8.57
10-12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.00	36.50	31.25
303	43.00	40.00	33.75
304	43.00	39.50	32.75
309	55.50	54.50	44.25
316	56.50	58.50	48.75
321	49.00	48.00	36.75
347	53.50	52.00	41.25
410	36.50	36.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.
Cleveland, strip A7.
Detroit, strip except Types 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip C18.
McKeesport, Pa., bars, sheets except Type 416 U8.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.
Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S8.
So. Chicago, Ill., bars & structurals U8.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309 316 sheets 61.50c, strip 63.00c, W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg. .. 26.00-33.00
Industrial xylol .. 25.00-33.50

Per ton, bulk, ovens
Sulphate of ammonia $32-$45

Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) .. 17.25
Do., less' than carlots .. 18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron	
98.+% Fe, carlots	16.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	42.00
Unannealed, 99.+% Fe	36.50
Unannealed, 99.+% Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	31.25-60.00
Phosphor-Copper, 10-ton	50.00
Copper:	
Electrolytic	43.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten:	Dollars
99% minus 80 to 200 mesh, freight allowed:	
1000 lb and over	4.00
Less than 1000 lb	4.15
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	4.15
less than 1000 lb	4.25
Molybdenum:	
99% minus 80 to 200 mesh, over 500 lb	2.85
200 to 500 lb	3.10
less than 200 lb	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdry.	17.00-18.00
New River, foundry	21.50
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Keayney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago, ovens	23.00
Chicago, del.	24.40
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	23.75
Chicago, del.	26.28
Cincinnati, del.	25.73
Detroit, del.	26.71
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.75
Erie, Pa., ovens	23.50
Birmingham, ovens	20.50
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Nevillelsland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., oven	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.60
Buffalo, del.	26.75
Flint, del.	26.40
Pontiac, del.	24.42
Saginaw, del.	26.81

* Or within $4.15 freight zone from works.

AMERICAN

Your PHILLIPS HEADquarters and SLOTTED HEADquarters

AMERICAN SCREW COMPANY
Willimantic, Connecticut

Main Office & Plant
Willimantic, Conn.

Office & Plant, Norristown, Pa.

Office & Warehouse
Chicago, Illinois

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	....	6.42	7.29	9.20	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.28	....	6.12	6.99	8.90	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	....	6.25	7.04	9.25	6.40	6.58	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	....	6.05	6.84	9.05	6.20	6.38	7.68
Phila. (city)	6.15	7.05	8.25	6.35	....	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	....	6.05	6.86	8.64	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	....	6.24	7.09	....	6.24	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	....	6.04	6.89	8.80	6.14	5.80	7.44
Norfolk, Va.	6.50	....	....	6.70	....	6.55	7.70	....	6.50	6.50	8.00
Richmond, Va.	5.90	....	8.10	6.10	....	6.10	6.90	....	6.30	6.05	7.80
Wash. (w/hse)	6.02	7.26	8.49	6.46	....	6.46	7.26	....	6.36	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	....	5.80	6.65	10.65	6.00	6.25	7.55
Buffalo (w/hse)	5.60	6.40	8.09	5.86	....	5.60	6.45	10.45	5.80	6.05	7.35
Pitts. (city)	5.60	6.40§	7.75	5.65-5.95	6.90	5.55	6.40	10.10	5.70	5.75	7.00
Detroit (w/hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.00	6.15-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w/hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	9.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	....	5.95	6.51	....	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	....	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w/hse)	5.60	6.40	7.75	5.55	....	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	....	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	....	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	....	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w/hse)	5.85	6.65	8.00	5.80	....	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	....	6.35	7.20	....	6.50	6.60	7.80
KansCity (w/hse)	6.20	7.00	8.20	6.15	....	6.15	7.00	....	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90§	5.70	....	5.70	7.55	....	5.85	6.10	8.25
Birm'hm (w/hse)	5.60	6.40	6.75§	5.55	....	5.55	7.53	....	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05§	6.60	8.90	6.55	7.75	....	6.55	6.60	9.20
L. A. (w/hse)	6.35	7.90	8.85§	6.40	8.70	6.35c	7.55	....	6.35	6.40	8.70
San Francisco	6.65	7.80§	8.90§	6.60	....	6.45	8.20	....	6.45	6.60	8.60
Seattle-Tacoma	7.05	8.60§	9.20§	7.30	....	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded), and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ¶ as annealed. Base quantities 2000 to 9999 lb except as noted; Cold-rolled strip, 2000 lb and over; Hot-rolled bars, 2000 lb and over; Plates, 500 to 1499 lb; 450 to 1499 lb; 3500 lb and over; Shapes, 1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern, Local Ore

Cents per unit, del. E. Pa.

Foundry and basis 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185, per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, le for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75%. C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30% max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 46c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-8 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

Note: Current prices on chromium alloys appeared on page 171, June 4 issue; silicon, boron and tungsten alloys, page 151, June 11. Vanadium, zirconium, calcium and briquetted alloys, page 157, June 18. Refractories prices were published on page 151, June 11.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

June 28	$44.00
June 21	44.00
May 1951	44.00
June 1950	39.25
June 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	42.00	44.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

OH and Blast Furnace Grades

2. No. 2 Heavy Melting	$2.00
3. No. 1 Bushelling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	3.00
6. Machine Shop Turnings	10.00
7. Mixed Borings & Short Turnings	6.00
8. Shoveling Turnings	6.00
9. No. 2 Bushelling	4.00
10. Cast Iron Borings	6.00

Elec. Furnace and Frdy. Grades

11. Billet, Bloom & Forge Crops	7.50
12. Bar Crops & Plate	5.00
13. Cast Steel	5.00
14. Punchings & Plate Scrap	2.50
15. Electric Furnace Bundles	2.00
Cut Structurals & Plate:	
16. 3 feet and under	5.00
17. 2 feet and under	5.00
18. 1 foot and under	8.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel:	
20. 2 feet and under	2.00
21. 1 foot and under	4.00
22. Springs and Crankshafts	1.00
23. Alloy Free Turnings	3.00
24. Heavy Turnings	1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	3.00
27. No. 2 Chemical Borings	4.00
28. Wrought Iron	10.00
29. Shafting	10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 45 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	3.50
6. No. 1 Turnings	6.00
7. No. 2 Turnings, Drillings & Borings	12.00
8. No. 2 Cast Steel and uncut wheelcenters	6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	8.00
11. Structural, Wrought Iron and or steel, uncut	6.00
12. Destroyed Steel Cars	9.50
13. No. 1 Sheet Scrap	9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 8.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	+ 8.00
32. Boilers	+ 6.00
33. No. 2 Sheet Scrap	11.00
34. Carsides, Doors, Car Ends, cut apart	+ 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.

(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

(4) For preparing into Grade No. 20, $6.

(5) For preparing into Grade No. 19, $6.

(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) For preparing into Grade No. 17 or Grade No. 21, $11.

(8) For preparing into Grade No. 18 or Grade No. 29, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intrasit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

(3) For preparing into Grade No. 16, $4.

(4) For preparing into Grade No. 17, $6.

(5) For preparing into Grade No. 18, $7.

(6) For preparing into Grade No. 21, $4.

(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 5210.

Switching Charges

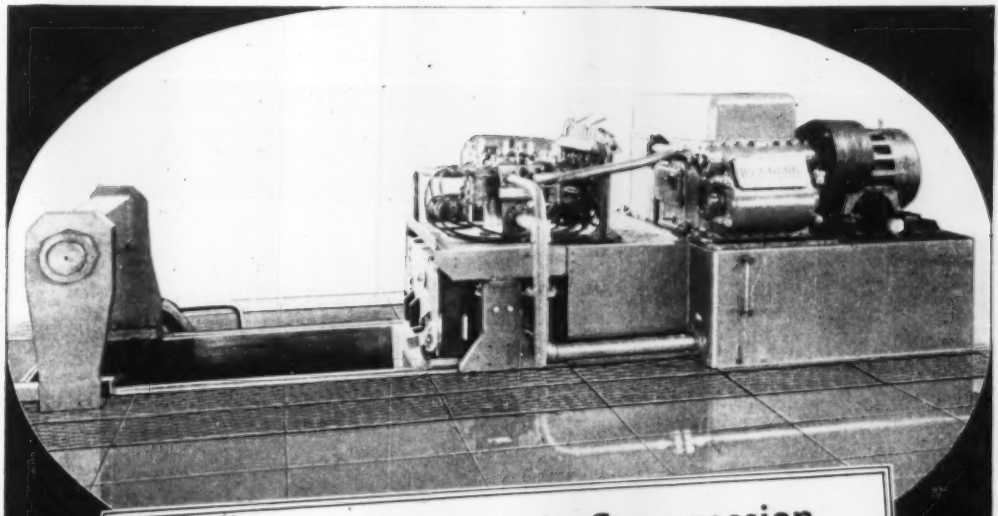
Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 56c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c; Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c; Coatesville, Pa., 56c; Conshohocken, Pa., 20c; Detroit, 95c; Duluth, Minn., 50c; Harrisburg, Pa., 51c; Houston, Tex., 57c; Johnstown, Pa., 75c; Kansas City, Mo., 78c; Kokomo, Ind., 51c; Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c; Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c; St. Louis (including Federal Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 56c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c; Warren, Pa., 75c; Weirton, W. Va., 70c; Youngstown, 75c.

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Bushelling	29.50
Bushlings new factory, prep'd	33.00
Bushelings new factory, unprep'd	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.



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Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

Also available are various sizes and types of pumps and operating valves to meet output requirements. Logemann Scrap Presses can be equipped with loading hopper in which the scrap charge can be prepared while the press is going through the operations on the preceding bale. Compressed bales are delivered at floor level for ejection to conveyor, steel chute, or into accumulation pit.

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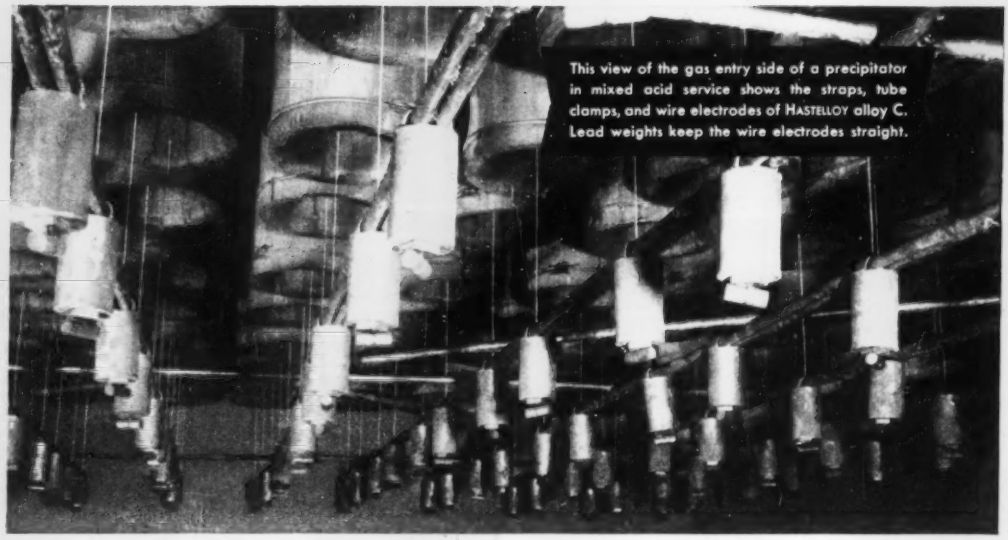

This view of the gas entry side of a precipitator in mixed acid service shows the straps, tube clamps, and wire electrodes of HASTELLOY alloy C. Lead weights keep the wire electrodes straight.

Precipitators Improved...

WITH NICKEL-ALLOY ELECTRODES

Electrostatic precipitators for removing corrosive liquids and solid particles from industrial process gases give better and longer service, without maintenance, when HASTELLOY alloy wire is used for electrodes. The alloy has excellent mechanical strength (130,000 psi) and is not attacked by the corrosive agents. This combination of properties makes it possible to use electrodes that are only 0.073 in. in diameter. The effective diameter of the lead-covered wire formerly used in most units was more than 0.500 inch. The smaller cross-section of the HASTELLOY alloy wire permits the use of higher voltages with a more uniform corona pattern.

HASTELLOY alloy C electrodes have been installed in mist precipitators where hydrochloric, sulphuric, sulphurous, and mixed acids were present. A recent check on an installation in an acid plant showed that the alloy C wires experienced no weight loss after a year's operation. Lead-covered steel wires, on the other hand, lasted an average of 11 months with electrode failure at least once a week.

For information on wrought forms of HASTELLOY alloy, write for the booklet, "HAYNES Wrought Alloys Price List."

HAYNES
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Alloys

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The Metal Market

Flow of red metal scrap expected to return to normal channels as result in re-establishment of pre-Korean price differentials. Brass mill copper scrap fixed at 21.50c

BRASS MILL operators are "hopeful" that the rollback in ceiling prices for red metal scrap will halt the diversion of shipments to other consuming channels. Brass mill scrap is a direct substitute for prime metals and constitutes anywhere from 20 to 70 per cent of the raw materials used in producing brass mill products. Its price is ordinarily at a relatively stable differential below the mixture value of its components.

During GCPR base period of Dec. 19 to Jan. 25, the brass mill scrap market was chaotic, with prices higher than new metal values. Mills were paying as much as 28.00c a pound for copper in scrap compared with 24.50c for primary electrolytic copper. Other classes of users paid up to 30.00c a pound for scrap.

CPR 47 establishes a price of 21.50c a pound for clean heavy copper (brass mill) scrap on the basis of the 3-cent pre-Korean differential below prime copper quotations. At the same time, CPR 46 was issued, establishing a ceiling of 19.25c a pound for No. 1 heavy copper and copper wire containing a minimum of 98.5 per cent copper. The two regulations fix ceiling prices for 69 grades of scrap.

CPR 46 applies to all sales of copper scrap and copper alloy scrap by industrial producers, railroads and government agencies; to sales by any person to a consumer, a dealer affiliated with a consumer, and exporters; and to sales by importers and exporters. Exempted from the order are transactions between dealers not affiliated with consumers; railroad scrap conversion transactions in which foundries take railroad castings and make new castings under an agreed conversion charge. The order provides certain preparation and packing premiums.

CPR 47 also provides that bills of sales covering transactions with mills or dealers must specify the trade or alloy name of the product from which the scrap was generated and the name of the brass mill producer. It also provides a ½-cent premium for sales by dealers to consumers. Interdealer premiums are provided to discourage excessive accumulation and expedite the flow of scrap.

Aluminum Output Steady

Domestic production of primary aluminum in April totaled 67,701 tons compared with 70,022 tons in March and 58,024 tons in April, 1950. The decrease from March was a reflection of the shorter month rather than a change in the rate of production. Despite the lower output, stocks at reduction plants increased by 1367 tons to a total of 13,415 tons.

Aluminum Co. of America, Pittsburgh, supplied over 2000 tons of aluminum products in the construction of S. S. UNITED STATES, the largest passenger vessel ever launched in this country. Superstructure of the 990-foot liner is, by several times, the largest aluminum assembly ever constructed.

Tin Stabilized at $1.06

Reconstruction Finance Corp. continued to offer Grade A tin at $1.06 a pound through June 28.

NPA allocated 7715 tons of pig tin for tin plate production in the third quarter. Fourth quarter allocations have not been determined, but indications are that they will be about the same as in the third quarter. Despite reductions in the price of foreign pig tin, it is predicted that there will not be more tin available for consumers in 1952 than in 1951.

Will Build Titanium Plant

H. K. Ferguson Co., Cleveland, has been awarded a contract, estimated at $10 million, for conversion of three National Lead Co. units into a titanium production plant. The titanium plant is expected to be in production early next year.

Copper Allocation Aug. 1

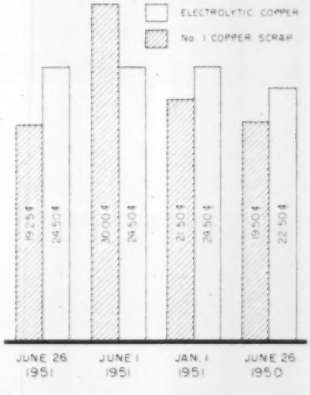
NPA will start allocating copper raw materials Aug. 1, pending revision of order M-16. Brass mills, copper wire mills and foundries must file applications for allocations of these materials on their June operations reports, which are due in Washington July 10 and are prepared on form NPAF-83. When certified by the NPA Copper Division and returned to the applicant, it will constitute an allocation certificate for copper raw materials. NPA also will allot refined copper and scrap for such miscellaneous uses as chemicals, insecticides and alloying agents.

It was emphasized that allocation of copper raw materials to the copper processing industry should not be confused with the allotment of controlled copper materials to manufacturers of finished products under CMP. Under the proposed allocation control, only scrap dealers and refiners would be permitted to purchase specified forms of copper raw materials without NPA authorization.

The current copper shortage is expected to continue for the remainder of the year. Fabricators stock position worsened in May with the deficit at the end of the month amounting to 299,648 tons. Their unfilled orders amounted to 323,454 tons while their stocks plus purchases amounted to only 23,806 tons. Consumption increased to 118,113 tons in May from 114,744 tons in April.

Copper Scrap Rollback

. . . restores normal differentials



Nickel, Zinc Still Short

Nickel shortage continues acute and may grow worse. Reduced imports of nickel ores, government stockpile requirements, a heavy demand for nickel in jet aircraft motors, newly developed ordnance equipment and important civilian needs are cited as reasons for the scarcity.

Demand for zinc also is substantially in excess of supply. Beginning Aug. 1, this metal will be placed under allocation.

Glidden Sells Lead Refinery

Glidden Co., Cleveland, has sold its secondary metals business conducted at Hammond, Ind., for a reported price of slightly less than $8.5 million. The facilities, which include a lead refinery and equipment for production of type metal, solder and antimonial lead products, were sold to three Chicago business men. The new owners plan to operate them as Metals Refining Co. Inc.

The sale was described by a Glidden official as another step in its program for expanding output of its Chemical and Pigment Division. The company plans to consolidate its powdered metal operations at Hammond.

Kaiser Project Certified

Kaiser Aluminum & Chemical Co., Oakland, Calif., has been granted a $1,158,700 certificate of necessity for expansion of facilities at the Trentwood aluminum ingot plant near Spokane, Wash.

DMA Finances Exploration

Defense Minerals Administration signed contracts with mine owners for more than $1 million of lead and zinc exploration work. These include contracts with Callahan Zinc-Lead Co., New Park Mining Co., Chief Consolidated Mining Corp., Combined Metals Reduction Co., Lupton Mining Co., Bristol Silver Mines Co., and Dodgeville Mining Co.

NONFERROUS METALS

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c; pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 5000 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.75-32.50c; No. 12 foundry alloy (No. 2 grade) 30.75-31.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.75-33.50c; grade 2, 30.00-31.50c; grade 3, 30.00-30.50c; grade 4, 28.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 106.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c, f.o.b. Laredo, Tex. for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 56.50c; 25-lb pigs, 59.50c; "X" nickel shot, 60.50c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $210-213 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del., special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 87.75c per oz.

Platinum: $90-93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base Prices, cents per pound, f.o.b. mill; effective May 23, 1951)

Sheet: Copper 40.18; yellow brass 37.28; commercial bronze, 95% 40.18, 90% 39.78; red brass, 85% 38.86, 80% 38.47; best quality, 75% 38.07; nickel silver, 18% 50.99; phosphor bronze grade A, 5% 50.42.

Rod: Copper, hot-rolled 36.03; cold-drawn 37.28; yellow brass free cutting 31.70; commercial bronze, 95% 39.87, 90% 39.47; red brass, 85% 38.55, 80% 38.15.

Seamless Tubing: Copper 40.22; yellow brass 40.22; commercial bronze, 90% 42.44; red brass, 85% 41.77.

Wire: Yellow brass 37.57; commercial bronze, 95% 40.47, 90% 40.07; red brass, 85% 39.15, 80% 38.76; best quality brass, 38.36.

Copper Wire: Bare soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18; 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 28 and 38 mill finish c.l.

Thickness Range Inches	Widths of Diameters, In. Inc	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	....	....
0.135-0.096	12-48	30.6	....	....
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.5
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.5	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round R317-T4, 178-T4	R317-T4	Hexagonal 178-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets: Full rolls 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 77.00c. Strip, cold-rolled 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 100.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 18-28	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
June 14	24.50	16.80	17.50	118.00	19.00	42.00	56.50	87.75
June 13	24.50	16.80	17.50	123.00	19.00	42.00	56.50	87.75
June 7-12	24.50	16.80	17.50	129.00	19.00	42.00	56.50	87.75
June 7	24.50	16.80	17.50	136.00	19.00	42.00	56.50	87.75
June 1-6	24.50	16.80	17.50	136.00	19.00	42.00	56.50	90.16
May Avg.	24.50	16.80	17.50	139.925	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	152.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

NOTE: Copper, Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime west, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.5c, under 1000 lb 62.5c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 26.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c; 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c; up 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, $1.22; 500 to 999 lb, $1.225; 200 to 499 lb, $1.23; less than 200 lb, $1.245. Freight allowed east of Mississippi and north of Ohio and Potomac.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 79.20c; 100 or 350 lb drums only, 100 to 600 lb, 64.50c; 700 to 1900 lb, 62.00c; 2000 to 9900 lb, 60.20c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl. less than 2000 lb $1.01½2; more than 2000 lb, 99.82c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl. 89.00c; 100 lb kegs 90.00c. Freight allowed.

Scrap Metals

BRASS MILL ALLOWANCES

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.25	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. bronze, A	27.00	26.75	25.75

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50. No. 1 borings 19.25. No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 8¾ cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 7¾ cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 17.25; cocks and faucets 16.75; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50; die cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

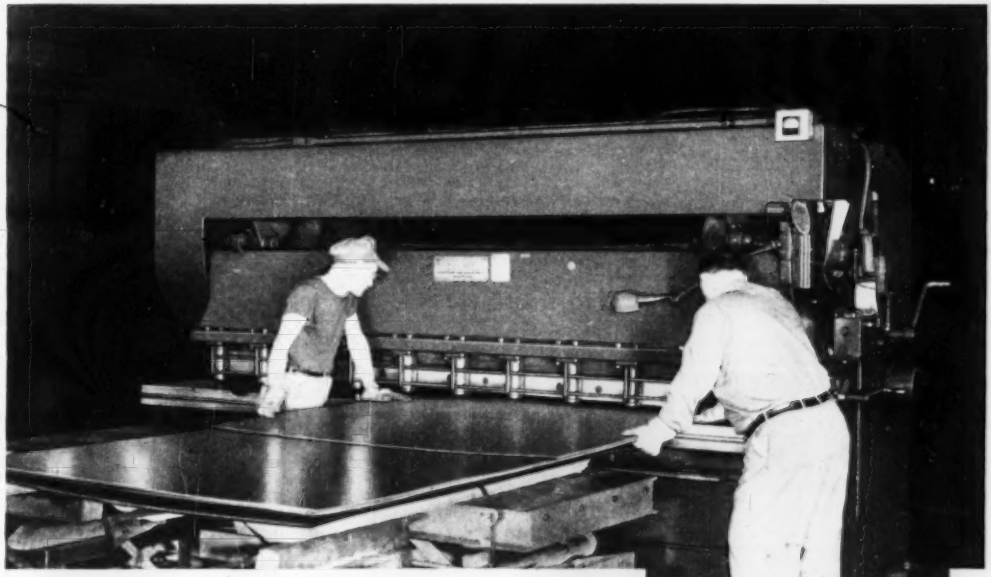
DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 16.50-16.75; battery plates 9.50-10.00; linotype and stereotype 17.00; electrotype 16.00-16.25; mixed babbitt 17.00.

Tin: No. 1 pewter 75.00-80.00; block tin pipe 105.00-110.00; No. 1 babbitt 65.00-70.00.

Aluminum: Clippings 28 21.50-22.00; old sheets 17.00-17.50; crankcase 17.00-17.50; borings and turnings 13.00-14.00.



High Production Shearing is done at The E. K. Wollman Co., Cleveland, with this No. 110 Steelweld Shear.

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2 SMOOTH, CLEAN CUTS Unusually smooth, clean cuts are obtained because of Steelweld's exclusive pivoted blade cutting action. The upper knife travels in a circular path and pulls away from lower knife immediately after shearing. This prevents binding of cut pieces between back gauge and knife. Knife wear is reduced.

3 QUICK, SIMPLE KNIFE ADJUSTMENT Best possible cut for any thickness plate can be made, because of Steelweld's exclusive Micro-Set knife clearance adjustment which can be made in a few seconds.

4 CONVENIENT, ACCURATE BACK GAUGE Before the gauge at rear of an ordinary shear can be reached, a Steelweld back gauge is usually set and the machine in operation, because the adjustment is on the outside of frame near front where conveniently reached. Ball bearing equipped, it is easily operated and accurate.

5 MAXIMUM PRODUCTION Steelweld Shears are built for heavy-duty high production work. The one-piece welded steel frame and all operating details are liberally designed to provide extra stamina. Servicing is simple. All parts are easily accessible. As a result, downtime is minimum and production maximum.

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STEELWELD PIVOTED BLADE SHEARS

Sheets, Strip . . .

Sheet and Strip Prices, Page 133 & 134

Boston—Interim and Directive amendments designed to smooth distribution under CMP have an adverse effect temporarily on normal leadtime for scheduling September tonnage. Many users with DO rated tonnage on mills' books are slow in converting to ACM orders.

New York—Some sellers are no longer in position to book hot-rolled sheets for third quarter, rated or unrated, due to substantial arrearages. Others, however, can take rated orders only for September. Still others claim they are not out of the market entirely on unrated hot and cold sheets.

Philadelphia—Sheet producers see little prospect for handling non-rated tonnage in September, but expect to have a better idea once the July 7 date has passed for the conversion of DO to CMP priorities. August will show a further marked drop in "free" tonnage, especially in hot rolled sheets and certain specialties.

Pittsburgh—Non-rated hot and cold carbon sheet supply will decrease in third quarter. Increases in tonnage to non-integrated producers will be checked by CMP officials who require monthly reports on receipts and inventories. Conversion orders again are in great evidence.

Cleveland—Peace feelers the past week or so caused a little change in market sentiment, some trade authorities giving voice to the view that a settlement of the Korean war could well result in some easing in demand pressure. In general, however, continued step-up in military and defense-support requirements is expected over remaining months of the year.

Chicago—At mill level there is no indication of consumer durable goods manufacturers easing up on requirements of flat-rolled products.

St. Louis—Rated sheet tonnage here will run 65 per cent of capacity under CMP. Producers predict more CMP tickets for September. Big fabricators, like stove and refrigerator makers, are having considerable success obtaining defense contracts, but the smaller interests are having trouble.

Steel Bars . . .

Bar Prices, Page 133

Boston—In applying CMP allotment numbers to defense volume previously booked, August and September, outlook for bar tonnage varies with industrial consumers. Indications are forge and bolt shops will be eventually better covered on steel requirements.

New York—Most sellers of plain carbon bars have not opened books beyond August on non-rated work and feel when the time comes for setting up schedules for September they will have relatively little capacity available. As a general rule, these sellers are not taking any DO-rated work beyond third quarter. In the case of hot-rolled alloy bars they are booking some unrated work for September.

Pittsburgh—Increased shipments to converters and increased set-asides for August spells minimum non-rated tonnage supply. Increase from 90 to 100 per cent base period receipts for non-integrated producers will not make any additional tonnage available to the civilian market as some think. Mounting defense requirements and directives will take up the increase.

Cleveland—Heavily booked up position of bar sellers precludes the possibility of any easing in supply conditions over coming months. Requirements on military and related account will take progressively larger tonnage from month to month. Vacation suspensions, and curtailment of operations in the durable consumer goods field will not materially ease the pressure on suppliers. In fact, expectations are buyers will continue to take in tonnage without interruption even in those instances where shops are less actively engaged. The "free" tonnage available in third and fourth quarter after military and essential needs have been satisfied will be limited but some steel authorities think supplies will be sufficiently large so that resort to complete government allocation will be unnecessary.

Wire . . .

Wire Prices, Page 135

Boston—Although wire mills are not filled to set-aside limits on high and low carbon increasing volume of production is coming under distribution controls through CMP and conversion of more tonnage from backlogs. Rod shortage hampers output, including rated orders. After matching semifinished against rated tonnage, less material is available for uncontrolled consumption.

Plates . . .

Plate Prices, Page 133

Boston—In validating DO orders to CMP for fourth quarter, volume of flanged work involved is relatively less than plates, and backlogs include some unrated volume. Status of this tonnage is uncertain. With most producers bulk of bookings is for defense-supporting requirements, rather than direct military orders.

Philadelphia—Very little plate tonnage will be available in third quarter for unrated work. Production will be off due to suspensions for repairs and vacations. Alan Wood Steel Co., Conshohocken, Pa., closed down its 84-in. mill last Thursday for three weeks for overhauling. For the same reason Lukens Steel Co., Coatesville, Pa., suspended operations July 1 for ten days on its 140-in. mill. Last Monday Claymont Steel Corp., brought in its 120-in. mill after having been down five weeks for repairs.

New York Shipbuilding Corp., Camden, N. J., booked five merchant ships for the Maritime Administration, requiring about 4000 tons of hull steel each, principally plates.

Pittsburgh—Foreign steel is still offered here. One lot of mild steel plates at 12.50c a pound Pittsburgh is described as "weldable and workable." Because of distressing experience with poor quality foreign steel, sellers are meeting sales resistance.

Seattle—Shortage of plates is a serious problem in the fabricating industry. Chicago Bridge & Iron Co. will fabricate four storage tanks, 180,000 barrels, for the Standard Oil terminal, Pasco, Wash. and one 42,500-barrel tank at Salt Lake City, involving 800 tons.

Tin Plate . . .

Tin Plate Prices, Page 134

Pittsburgh—NPA urged tin plate producers not already doing so to make terne plate. Tin plate requirements for closures in third quarter come to 102,000 tons; 51,000 tons crown closures, 43,000 tons for commercial closures and 8000 tons for home canning closures. Third quarter 1950 figure was 91,000 tons. Increase reflects growth of glass closure use.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 137

Pittsburgh—Oven coke remains unchanged with supply keeping pace with demand. Beehive grades are in slow demand and will become slower next month when a local blast furnace goes down for repairs.

Cleveland—Pressure for foundry coke is off with the vacation season at hand. Beginning July 2 at least 10 foundries in this immediate area will close down one to two weeks for vacations. A number of them have requested that coke shipments be held up pending resumption of operations.

Structural Shapes . . .

Structural Shape Prices, Pag 133

Boston—Fabricated structural steel contracts, 100 tons or more, placed in New England, first six months, 1951, totalled 42,550 tons compared with 31,532 tons, same period, 1950. Nearly one-fourth, not including 15,000 tons about to be placed, was for Central Artery structures, Boston. Contracts in this category last year totalled 85,325. Bulk of steel for defense plant expansion has been placed, but 15,000 tons for a forge press building, Wyman & Gordon Co., North Grafton, Mass., is soon to be closed.

New York—Structural bookings in May of 233,087 tons were 20.7 per cent below the April level, but 12.6 per cent ahead of May, 1950, says the American Institute of Steel Construction. Shipments were practically the same as in April and represent an increase of 19.7 per cent over a year ago. Shipments in May totaled 233,087 tons against revised totals of 234,707 tons in April and 194,752 tons in May 1950. Shipments during first five months totaled 1,112,519 tons, up 27.5 per cent over the year before.

Philadelphia—New inquiry is off but fabricators are more concerned about getting out work on books. Plain material is scarce.

Seattle—Backlogs are heavy with fabricating plants booked through fourth quarter. Several contracts for Alaskan military projects are pending, also 600 tons for a bridge at Lucky Peak dam project, Idaho, and 600 tons for expansion of the Rock Island power plant, Washington state.

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4. FOUR POINT CHAIN SUSPENSION — less swinging and "tipping" when picking up a load not properly centered — added chain life.
5. EXTRA HEAVY REINFORCED MANGANESE COIL SHIELD — strength where it's needed—25% more protection for the coils.
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8. WATER PROOF, SHATTER PROOF jerk resistant molded neoprene neck cable connectors.
9. TAMPER PROOF sealed terminal box.
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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 133

Boston—Bidding 11.00c on 1080 tons, substructure, and 10.90c per pound in place, 750 tons, deck, contracts C-1 and C-2, Boston Central Artery, V. Barletta & Co., Roslindale, will place 2180 tons for this project. Volume of concrete reinforcing bars to be bought is substantial with contractors having difficulty in placing tonnage even on rated projects.

Tubular Goods . . .

Tubular Goods Prices, Page 137

Los Angeles—Large utility programs for replacement of old lines and installation of new ones sustains pipe demand. Kaiser Steel Corp.'s pipe mill is sold out through third quarter.

Seattle—Largest project pending for cast iron pipe involves 1400 tons for Seattle's Bothwell Way improvement, bids July 27. Bremerton, Wash. has awarded 400 tons of 12 to 4 in. pipe to H. G. Purcell, Seattle. Demand is fair but delivery conditions are unfavorable.

Pig Iron . . .

Pig Iron Prices, Page 132

New York—District pig iron melt will be off over the next couple weeks, particularly the current week, because of the holiday. Some foundries will close down for vacations. Most, if not all foundries will have men on hand to handle incoming shipments of raw materials, especially pig iron.

So far few foundries have had to curtail operations in any appreciable degree because of metallics shortage. Actually more consumers recently have had to curtail because of inability of their own customers to maintain the balanced inventory of materials they need.

Philadelphia—Production at the smaller of the two blast furnaces at Swedeland has been suspended for July, due to ring trouble. Meanwhile, the Chester, Pa., furnace of Central Iron & Steel Co., blown in early in June is gradually stepping up output with 500 tons daily an early goal. No offering of iron for merchant use is reported.

Reflecting general shortage is recent purchase by a district mill of Austrian iron for delivery in August and September at a price substantially above the domestic market, reported in some quarters at around $80, f.o.b. eastern port. Import duty on pig iron has been reduced 15 cents to 60 cents per ton.

Pittsburgh—Pig iron production proceeds above rated capacity with all 54 district stacks in operation. Demand has increased due to adjustment of furnace practice to compensate for lack of scrap. Foundries are having difficulty keeping production levels due to scarcity of special grades.

Cleveland—Some letdown in the iron melt is expected due to the mid-week holiday. Vacation season, also is getting into full swing and may affect foundry consumption of pig iron to some extent. However, vacation slackening will be less noticeable this year than ordinarily with shops on defense work committed to uninterrupted schedules. Demand for iron is unabated with sellers apportioning tonnage in as equitable fashion as possible.

Chicago—Although gray iron foundry operations have slackened somewhat, demand for pig iron continues to exceed supply.

Iron Ore . . .

Iron Ore Prices, Page 139

Cleveland—Shipments of Lake Superior iron ore exceeded the 3 million ton mark for the third consecutive week in the period ended June 25. The season's cumulative total now is 29,506,189 tons compared with 19,394,399 tons for the like period a year ago.

Scrap . . .

Scrap Prices, Page 140

Boston—Steel scrap shipments are not sufficient to improve inventories with consumers. From Watertown arsenal, 1000 tons of alloy turnings have been allocated while 21 bid on an offering of 500 tons of triple alloy turnings, ceiling prices, awarded by lot.

Buffalo—Although mill stockpiles are low, a better feeling is apparent in the scrap market. Dealers report heavier movement in the local area. Water receipts also help with a fleet of seven barges from the eastern seaboard arriving early last week. Approximately 85,000 tons have arrived by water this season.

Philadelphia—Leading steel scrap consumers are drawing upon inventories to maintain present high operations. The immediate outlook promises little relief. Scrap yard inventories are reported at lowest level in a long time. Pressure for cast grades has eased a bit with various foundries down this week for vacations, in some instances for next week as well.

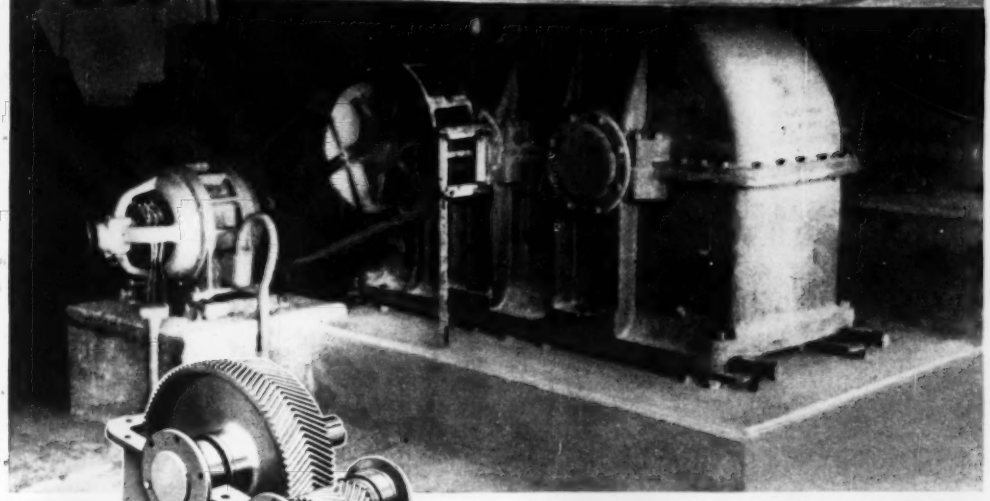
Pittsburgh—Projected steel ingot rate over the past few weeks has not quite been realized because of the scrap dearth here. Scrap price committee has not ruled on proposed grouping of grades under one classification and price. Opinion is that ruling is held off pending congressional action on extension of defense laws. Industrial scrap movement has fallen off but miscellaneous dealer scrap has picked up, though not enough to offset industrial scrap decrease. Railroad scrap remains the same with about 90 per cent earmarked. Turnings are scarce.

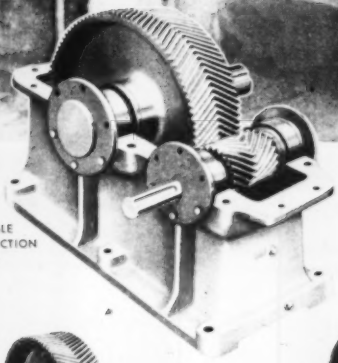
Detroit—Dealers expect scrap receipts to go into a downspin this month. The trend has been that way for the past 60 days and with automotive production rates due for cutbacks further decline is regarded as inevitable.

Cincinnati—Mill inventories of scrap are critically low, with shipments barely matching the melt. Major mill interests are depending on allocations to obtain adequate tonnage. Some foundries are on allocations also.

Chicago—Scrap supply is unchanged. Two steel mills are receiving tonnage close to melting rate. Inventories are shrinking as steel-

BALANCED DESIGN MEANS LONGER, TROUBLE FREE SERVICE





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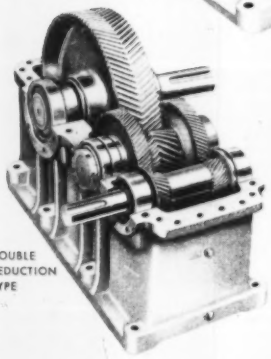
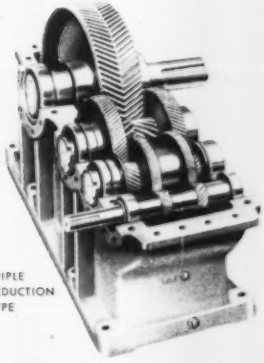
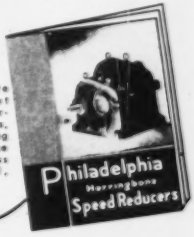


DOUBLE REDUCTION TYPE



TRIPLE REDUCTION TYPE

For complete details about Philadelphia Herringbone Units, send for catalog H-49 . . . use your business letterhead, please.



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making clings tenaciously to the 106 per cent of capacity figure.

St. Louis—Scrap shipments to this district dropped as much as 20 per cent the last two weeks because of heavy rains and increasing farm field work. Dealers' yards are about cleared of unprepared scrap.

Mill inventories average 10 to 14 days but are badly unbalanced. Small foundries are in comfortable position due to allocations.

Seattle—Receipts of steel scrap are substantial but not sufficient to add materially to inventory. The collection campaign is producing results. Quality is below normal.

Warehouse . . .

Warehouse Prices, Page 139

Cleveland — Vacation suspensions and curtailments are resulting in some slackening of demand on the warehouses. Holiday interruption this week will add to the easing in pressure. In the main, however, no sharp slump in volume is anticipated over coming weeks as consumers indicate a desire to build inventories. More shops are getting defense contracts, offsetting the slower pace in civilian durable goods.

Chicago—Demand for steel products at warehouse level continues to show the easing first reported a week ago. Stocks are extremely low and unbalanced.

Los Angeles—Walter S. Doxsey, president, American Steel Warehouse Association, predicted closing of the "open end" of CMP by start of fourth quarter, at a meeting of the Southern California chapter of the organization. Pleading for more steel for warehouse customers, he pointed out that M-6 mill quotas should be based on 85 per cent of 1951 tonnage receipts, a year of higher steel production than the currently used 1950 period. He predicted an increase in M-6 mill quotas to distributors on a product basis.

Canada . . .

Toronto, Ont.—Importers who require steel from the United States in the period September to Dec. 31, are required to make special application to the Steel Division of the Department of Defense Production.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1300 tons, new manufacturing plant, Hotpoint Inc., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

3000 tons, manufacturing building, Delco-Remy Division, General Motors Corp., Anderson, Ind., to Indiana Bridge Co, Inc., Muncie, Ind.

1800 tons, warehouse, Army, Granite City, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

1500 tons, building No. 44, Nash-Kelvinator Corp., Kenosha, Wis., to Worden-Allen Co., Milwaukee.

1400 tons, steam electric plant, Virginia Electric & Power Co., Norfolk, Va., to Bristol Steel & Iron Works Inc., Bristol, Va.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

800 tons, residence hall, medical center, University of Illinois, Chicago, to Wendnagel & Co. Inc., Chicago; James McHugh Construction Co., that city, contractor.

624 tons, three warehouses, Warren, O., U. S. General Services Administration, to J. T. Edwards Co., Columbus, O.

624 tons, three warehouses, Hammond, Ind., General Services Administration, to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, radio chemistry building, Hanford, Wash., Works, to Pacific Car & Foundry Co., Seattle; Peter Kiewit Sons Co., Seattle, general contractor.

525 tons, three hangars (Dover and New Castle, Del., and Pittsburgh) district Army engineers, Philadelphia, to American Bridge Co., Pittsburgh.

500 tons, two cranes for the Ross dam powerhouse, to Star Iron & Steel Co., Tacoma, Wash.

419 tons, bridge, section 42SF-9, Cook county, Illinois, to Bethlehem Steel Co., Bethlehem, Pa.

416 tons, two warehouses, Dayton, O., General Services Administration, to International Steel Co., Evansville, Ind.

376 tons, bridge, project S-264(6), Sweetwater county, Wyoming, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

326 tons, approach to Congress street expressway, Chicago, to Wendnagel & Co. Inc., that city; Robert R. Anderson Co., Chicago, contractor.

300 tons, bridge FN-64, Jasper county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

300 tons, bridge, section 146F, St. Clair county, Illinois, to Illinois Steel Bridge Co., Jacksonville, Ill.

300 tons, plant addition, Parker Pen Co., Janesville, Wis., to Wisconsin Bridge & Iron Co., Milwaukee.

300 tons, crane for Detroit dam to Star Iron & Steel Co., Tacoma, by U. S. Engineer.

250 tons, barker building, St. Paul & Tacoma Lumber Co., Tacoma, Wash., to Star Iron & Steel Co., Tacoma.

236 tons, bridge, FO 6-1(26), Waukesha county, Wisconsin, to American Bridge Co., Pittsburgh.

200 tons, bridge, FN-917, Story county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

200 tons, McKinley school, Fairfield, Conn., to Leake & Nelson Co., Bridgeport, Conn., through George L. Hickey, Stamford, Conn., general contractor.

200 tons, two 100-ton gantry cranes for Albeni Falls, Idaho, dam project, to Star Iron & Steel Co., Tacoma, Wash.

200 tons, addition to Hooker Chemical Co. plant, Tacoma, Wash., to Star Iron & Steel Co., Tacoma.

192 tons, bridge, FN-52, Cherokee county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

175 tons, including plates for 300,000-gallon storage tank for plant addition, Pennsylvania Salt Co., Tacoma, Wash., to Star Iron & Steel Co., Tacoma.

145 tons, bridge, S-995-1, Mitchell county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

130 tons, bridge, S-1956(1), Dallas county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

118 tons, bridge, FN-85, Butler county, Iowa, to Des Moines Steel Co., Des Moines, Iowa.

115 tons, state bridge and approaches, Lee, Mass., to American Bridge Co., Pittsburgh; Warner Bros. Inc., Sunderland, Mass., general contractor.

105 tons, bridge 6704, Crookston, Minn., to American Bridge Co., Pittsburgh.

62 tons, power plant structures, Boro Electric Works, Wallingford, Conn., to Topper & Griggs, Hartford, Conn.

STRUCTURAL STEEL PENDING

18,000 tons, transmission towers, specification DS-3391, Mitchell, S. Dak., for Bureau of Reclamation, Denver; American Bridge Co., Pittsburgh, low.

11,000 tons, warehouses, Army Engineers, Tobyhanna, Pa.; bids soon.

7000 tons, transmission towers, specification

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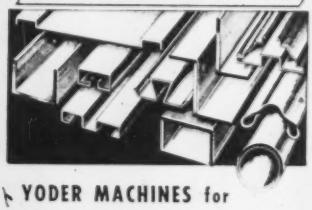

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PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASSACHUSETTS

DS-3392, Mitchell, S. Dak., for Bureau of Reclamation; Bethlehem Steel Co., Bethlehem, Pa., low.
3200 tons, arsenal, near Metuchen, N. J.; bids July 10.
2650 tons, Congress street bascule bridge, Chicago; bids in.
2008 tons, section, Schuylkill Express, Montgomery county, Pennsylvania; bids July 27.
1800 tons, power house, Lake Andes, S. Dak., for District Engineer's Office, Omaha, Nebr.; bids in.
845 tons, hangars, airfields, Falmouth, Mass., Presque Isle, Me., Chicopee, Mass.
800 tons, Mores Creek bridge, Idaho, Lucky Peak dam project; Roy L. Bair & Co., Spokane, Wash., low to U. S. Engineer, $819,660.
800 tons, warehouse, Wright-Patterson airfield, Dayton, O., for District Engineer's Office, Dayton, O.; bids in.
675 tons, 511-foot four-span plate girder bridge, Windsor, Conn.; Brunalli Construction Co. Inc., Southington, Conn., low; also 170 tons, reinforcing, and 81 tons piling.
600 tons, Rock Island, Wash., powerhouse addition; bids opened by Stone & Webster, Boston, June 22.
400 tons, buildings, Fort Dix, Burlington county, New Jersey; Fred Brotherton, Hackensack, N. J., low on general contract.
350 tons, classroom building, State Teachers College, New Haven, Conn.; bids July 7.
265 tons, grade separation structures, New Haven and East Haven, Conn.; Mariani Construction Co., New Haven, low; also 190 tons, reinforcing.
160 tons, two continuous steel stringer bridges, Belmont, Mass.; V. Barletta & Co., Boston, low; also 150 tons, reinforcing.
140 tons, two wide-flanged beam bridges, Thetford, Vt.; bids in.
150 tons, public school No. 6, Brooklyn, N. Y.; bids July 7.
100 tons, state bridge, Lancaster county, Pennsylvania; bids July 27.
Unstated, Juneau avenue bascule bridge, Milwaukee; bids July 30.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, steam electric plant, Virginia Electric & Power Co., Norfolk, Va., to Hall & Hodges Co., Norfolk; Stone & Webster Engineering Corp., Boston, engineer-contractor.
400 tons parking facilities, Sears, Roebuck & Co., Tacoma, Wash., to J. D. English Steel Co., Tacoma.
400 tons, power plant structures, Boro Electric Works, Wallingford, Conn., to Bethlehem Steel Co., through M. J. Mangin Inc., Naugatuck, Conn., general contractor.
240 tons, bachelor officer quarters, O'Hare Field, Chicago, to Truscon Steel Co., Youngstown; A. L. Jackson Co., Chicago, contractor.
208 tons superstructure, Aeroproducts Co., Vandalia, O., to United States Steel Supply Co., Chicago.
170 tons, hospital addition, Stoneham, Mass., to United States Steel Supply Co., Cambridge, Mass.; James S. Kelliher, Quincy, Mass., general contractor.
40 tons, McKinley school, Fairfield, Conn., to Fireproof Products Co., New York, through George L. Hickey, Stamford, Conn., general contractor.

REINFORCING BARS PENDING

3700 tons, exclusive of precast concrete piles, state bridge, across Bay Saint Louis, Mississippi; general contract to Merritt, Chapman & Scott, New York; also 675 tons of structural steel.
3500 tons, Army dormitories, Elmendorf and Ladd air bases, Alaska; bids rejected; new call to be issued soon.
1830 tons, contracts E-3 and E-1, deck and substructure, Charles river bridge—Haymarket square section, Central Artery, Boston; V. Barletta & Co., Boston, general contractor.
750 tons, new Wabash river power station, units 3 and 4, Terre Haute, Ind.
700 tons, first units new Antibiotic plant, Eli Lilly & Co., Lafayette, Ind.; H. K. Ferguson Co., Cleveland, general contractor.
690 tons, Personnel Division buildings, Sgt. Norman Beatty Memorial hospital, Wartville, Ind.; Joseph J. Duffy Co., Chicago, low on general contract.
500 tons, storage igloos, Ft. Campbell, Ky.
240 tons, bachelor officer quarters, O'Hare Field, Chicago.
140 tons, water works, Mount Vernon, O.
130 tons, bridge, White Bear, Minn.
129 tons, St. Francis Borgia School, Chicago.

PLATES . . .

PLATES PLACED

10,000 tons, 12 storage tanks, Lakehead Pipeline Co., Superior, Wis., to Chicago Bridge & Iron Co., Chicago.
2200 tons, three 125-barrel storage tanks, Hastings, Minn., for U. S. Corps of Engineers, Omaha, Nebr., to Graver Tank & Mfg. Co., East Chicago, Ind.
1500 tons, seven fuel storage tanks, Navy, Jacksonville, Fla., to Chicago Bridge & Iron Co., Chicago.
800 tons, additional storage facilities, Pasco, Wash. and Salt Lake City, Utah, for Standard Oil Co., to Chicago Bridge & Iron Co., Seattle.

PLATES PENDING

4000 tons, penstocks, Pole Hill power house, Champion, Colo., for Bureau of Reclamation; bids in.
473 tons, 16 spare mitre gates, Joliet, Ill.; for District Engineer's Office, Chicago; bids in.
400 tons, including shapes, 84-foot steel vessel for Fish & Wildlife Service; general contract to Tacoma Boatbuilding Co., low $206,928.
Unstated, 150,000-gallon storage tank, Orange county, farm, near Florida, N. Y.; bids July 7.

PIPE . . .

CAST IRON PIPE PLACED

400 tons, 12 to 4 inch for Bremerton, Wash., to Hugh C. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

1400 tons, 4000 feet, 24 inch; 14,000 feet 16 inch, Bothell Way improvement; bids to Seattle, July 27.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago, Milwaukee, St. Paul & Pacific, 78 diesel-electric locomotive units: Six 3-unit 4500-hp freight locomotives, six 3-unit 4500-hp passenger locomotives, twelve 1500-hp road switching units and three 1200-hp switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; ten 1200-hp switching units, to Fairbanks, Morse & Co., Chicago; ten 1000-hp switching units to American Locomotive-General Electric Companies, Schenectady, N. Y.; seven 1200-hp switching units to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.
Lehigh & Hudson River, two 1600-hp diesel-electric road switching units to American Locomotive-General Electric Companies, Schenectady, N. Y.
Northern Pacific, 23 diesel-electric locomotive units, of which four 1000-hp switching units will be built by American Locomotive-General Electric Companies, Schenectady, N. Y., and the remainder, comprising three 1200-hp switching units, four 1500-hp road switching and one 1500-hp freight units, two 4-unit 6000-hp freight locomotives and one 3-unit 4500-hp passenger locomotives, by Electro-Motive Division, General Motors Corp., La Grange, Ill.
Texas & Pacific, 20 diesel-electric locomotive units to Electro-Motive Division, General Motors Corp., La Grange, Ill. List comprises six 1500-hp freight, six 1500-hp road switching, and eight 800-hp switching units.

RAILROAD CARS PLACED

Denver Rio Grande Western, 1000 seventy-ton drop-door gondolas, to General American Transportation Co., Chicago.
St. Louis-San Francisco, 100 fifty-ton pulpwood cars, to own shops.
Wabash, 1000 50-ton box cars, to American Car & Foundry Co., New York, for construction at St. Louis.

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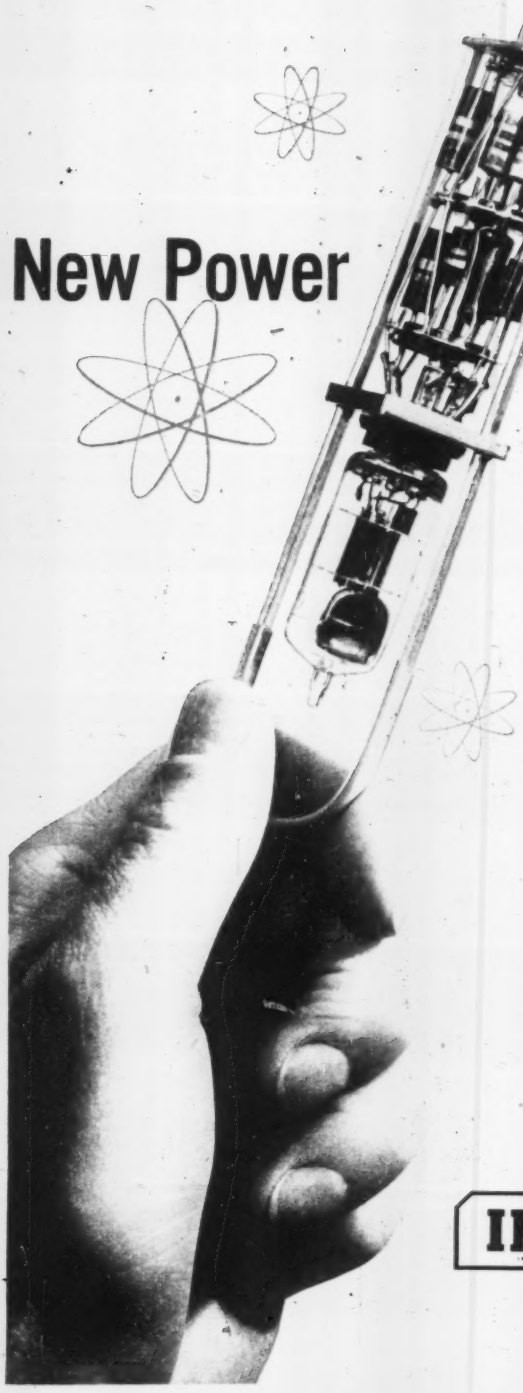

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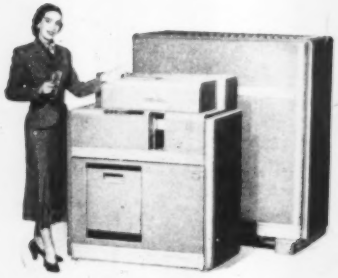

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Calstrip Enlarges Facilities

Five annealing furnaces are being installed by Calstrip Steel Corp., Los Angeles, in its recently completed building in that city. The furnaces, including three new ones and two from the company's former annealing equipment, will increase annealing capacity 42 per cent. Within a few weeks Calstrip expects to begin installation of a four-high cold reduction mill which will increase its rolling capacity about 25 per cent. This job will be completed by mid-August. DO orders constitute 35 per cent of the company's present business.

Wel-Met To Build New Plant

Wel-Met Co., Kent, O., will build a plant in Salem, Ind. The plant will triple the company's production of self-lubricating bearings and structural and mechanical parts made of sintered metal powder. Parts to be manufactured at the new plant will be used on aircraft, tanks, trucks and other war materiel.

Simonds Abrasive Co.

New branch offices and warehouse facilities in Chicago and Detroit were opened by Simonds Abrasive Co., Philadelphia. The Chicago warehouse of this manufacturer of grinding wheels and abrasives is located at 3323 W. Addison St. and is occupied jointly with the parent company, Simonds Saw & Steel Co., Fitchburg, Mass. In Detroit, the warehouse is located at 17155 Conant Ave.

Appoints Transformer Agent

Standard Transformer Co., Warren, O., appointed Carl A. Froebel Co. as its representative for eastern Missouri and southern Illinois.

Uniform Tubes Moves Plant

Uniform Tubes moved officially July 1 to its new plant at Collegeville, Pa., 20 miles northwest of Philadelphia. Production capacity at the new plant will be about 250 per cent larger than that of the old plant in Roxborough, Pa.

Brad Foote Gear Expands

Brad Foote Gear Works Inc., Chicago, is operating its recently acquired plant in Lemont, Ill. The plant increases by over 50 per cent the company's total work area and is operated by American Gear & Mfg. Co., a wholly-owned subsidiary of Brad Foote. Brad Foote's order backlog has jumped to $20 million from $400,000 since last July despite a continually increased rate of production and expansion of plant facilities.

Observes Golden Anniversary

Colonial Steel Co., Monaca, Pa., is celebrating its 50th anniversary. The company also announces it will install a 25,000-pound capacity electric furnace and auxiliary equipment.

New Contest for Designers

Meehanite Metal Corp., New Rochelle, N. Y., is conducting a contest open to engineers and designers offering cash prizes. Object of the contest is to secure complete descriptions and illustrations of products and equipment designed to incorporate Meehanite castings as component parts. Contest closes September, 1951.

Kuljian Moves Branch Office

Washington offices of Kuljian Corp., Philadelphia, were moved to 1832 K St. N.W. Increased demands upon the engineering and construction services of the corporation by various government agencies made it necessary to expand the staff and the office space of the Washington office.

Acme Wire Products Moves

Acme Wire Products Co. Inc. moved its factory and offices to larger quarters at 2519-37 Germantown Ave., Philadelphia.

Weber Buys Airquipment Co.

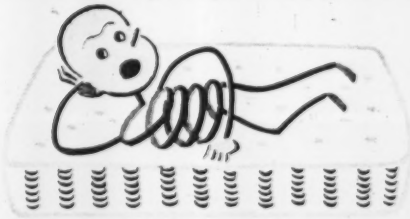
Weber Showcase & Fixture Co. Inc., Los Angeles, purchased Airquipment Co., a subsidiary of Lockheed Aircraft Corp., Burbank, Calif. Aerol Co. Inc., subsidiary of Airquipment, is not included in the sale and becomes a direct subsidiary of Lockheed. Airquipment will continue manufacturing ramps, jacks, trucks, ladders, slings, covers and airplane-servicing items.

Names Welding Distributors

Five new welding distributors were appointed by Welding Division, General Electric Co., Fitchburg, Mass. Serving New York state from Poughkeepsie west to Geneva is Welding Equipment Engineering & Equipment Co., Syracuse; eastern and northern New Jersey, metropolitan New York and Long Island, and New York state north as far as Poughkeepsie, Welding

Coil Spring says:

LOOK AT THE REST



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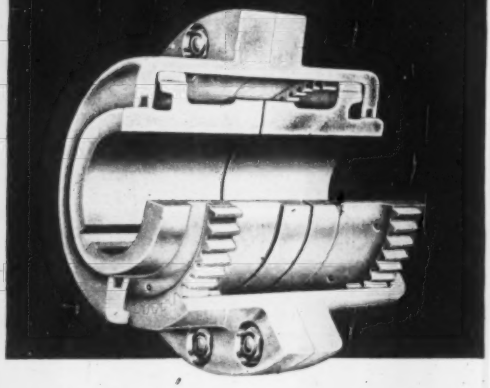

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

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Sales Corp., Newark, N. J.; New York state west of Geneva, Welding Equipment Sales Co., Buffalo; Birmingham area, Alabama Oxygen Co., that city; Toledo, O., area, Odland Iron Works, that city.

Oneida Ltd. To Build Plant

Oneida Ltd., Sherrill, N. Y., will erect a $1 million plant building to handle defense contracts. The firm is a subcontractor from Wright Aeronautical Corp. for the machining and finishing of compressor blades.

Changes Corporate Name

A change in its corporate name to United Can & Glass Co. was announced by Atlas Imperial Diesel Engine Co., Hayward, Calif. Mail for the Fullerton plant should be addressed to P. O. Box 192, Fullerton, Calif.

Flexible Tubing Expands

Flexible Tubing Corp., Guilford, Conn., opened a new division, the Inflatables Products Division, for the manufacture of defense products. Manufacturing facilities will be expanded.

Elmes Begins Second Century

Elmes Engineering Division, American Steel Foundries, Cincinnati, is celebrating its 100th anniversary this year. The Elmes organization is one of the leading manufacturers of hydraulic presses and equipment. Its original plant in Bath, Me., was devoted to job-work machining, principally for the marine industry.

Cleveland Chain & Mfg. Co.

Industrial Sales Division was organized by Cleveland Chain & Mfg. Co., Cleveland. The new division is headed by C. J. Gerker under the general supervision of David J. Gemmell, vice president and director of sales.

Plans $50 Million Plant

Brown & Root Ltd., Canadian subsidiary of Brown & Root, Houston, will build a $50 million plant in Edmonton, Alberta, for Canadian Chemical Co., reports John D. Tennebresque, New York, general manager. Production is planned for early 1953.

Lear Expands on West Coast

Lear Inc., Grand Rapids, Mich., will double its present West Coast production capacity by constructing a $400,000 factory and hangar in Los Angeles.

Marman Products To Build

Marman Products Co. Inc., Inglewood, Calif., will increase manufacturing space by 300 per cent by construction of a plant at 11214 Exposition Blvd., West Los Angeles, Calif. The company manufactures clamps, straps, couplings and aircraft fastening devices.

Continental Can Expanding

Continental Can Co. Inc., New York, plans to erect a plant in Pittsburg, Calif., for the manufacture of fibre shipping drums.

Bowen Opens Detroit Office

Plant of Bowen Products Corp., formerly located at Ecorse, Mich., is now at 7 Canal St., Auburn, N. Y. The company opened a regional sales office at 1726 Guardian Bldg., Detroit 26. T. G. Gwardinski is the regional sales manager. The company makes oil and grease cups, lubricators and sheet metal stampings.

Moldcast Products Moves

Moldcast Products Inc. moved to a new plant with increased facilities at foot of Pacific Street, Newark 5, N. J. The company produces permanent mold aluminum castings and manufactures outdoor floodlights.

Sugarman Buys Chicago Firm

J. J. Sugarman Co., Los Angeles, purchased Venn-Severin Machine Co., Chicago manufacturer of diesel engines. Willis Hirsch, a partner in the Sugarman firm, becomes president of the newly acquired company.

Plans $2 Million Addition

Republic Rubber Division, Lee Rubber & Tire Corp., Conshohocken, Pa., will build a $2 million addition to its Youngstown plant to manufacture steel and textile braided hose for jet fighter planes. The addition will add 12 per cent in floor space to the plant now making mechanical rubber goods, including some for the steel industry.

Work on Chrysler Plant

Chrysler Corp.'s new Indianapolis parts manufacturing plant is rapidly taking shape with more than half of its structural steel already erected. At the present rate, construction work is expected to be completed by late summer.

Latrobe Names Texas Agent

Latrobe Electric Steel Co., Latrobe, Pa., appointed Engineering Sales Co., Dallas and Houston, as exclusive representative for its tool and die steels in the state of Texas.

Files Incorporation Papers

Charters of incorporation were filed with the secretary of state's office, Dover, Del., by Columbia Protektosite Co. Inc., machinery; Universal Machinery &

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METAL	GOVERNMENT SPECIFICATION	ACP SPECIFICATION CHEMICAL
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	U.S.A. 57-0-2, Type II, Class B U.S.A. 51-70-1, Finish 22.02, Class B	"PERMADINE"
	U.S.A. 57-0-2, Type II, Class A U.S.A. 51-70-1, Finish 22.02, Class A	"THERMOIL-GRANODINE"
ALUMINUM	MIL-C-5541 MIL-S-5002 AN-F-20 U.S. Navord O.S. 675 16E4 (Ships)	"ALODINE"
ZINC	QQ-P-416 RR-C-82 JAN-F-495 AN-F-20 U.S.N. Appendix 6	"LITHOFORM"

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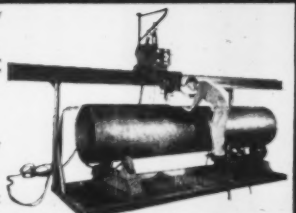

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Equipment Corp.; Hackett Processing Corp.; Ev-Ler Co., metals; W. H. Coe Mfg. Co. Inc. of New York and W. H. Coe Mfg. Co. Inc. of Illinois, metals. Corporation Trust Co., Wilmington, Del., is serving as the principal office of each of these firms. Charters were filed also by Leasage Machinery Plan Inc. and by Read Machinery Co. Inc., with U. S. Corporation Co., Dover, designated as the principal office.

Crucible Buys Ebaloy Inc.

Crucible Steel Castings Corp., Milwaukee, will acquire Ebaloy Inc., Rockford, Ill., aluminum foundry firm under a plan of reorganization approved by the federal district court in Chicago. Barcus, Kindred & Co., Chicago municipal bond underwriting firm, holds the controlling interest in Crucible.

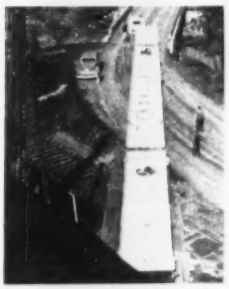
Will Build 76 Coke Ovens

Semet-Solvay Division, Allied Chemical & Dye Corp., New York, will build 76 Wilputte underjet coke ovens as an addition to its Ashland, Ky., plant. These new ovens are expected to be in full operation by early 1953. This increased production will aid materially in alleviating the shortage of industrial coke which has been particularly acute in the midwest.

Offers Brazilian Iron Ore

Vale do Rio Doce Agency Co. was formed to act as sales representative for Companhia Vale do Rio Doce, Rio de Janeiro, Brazil. Howard Williams is president of the company with offices at 63 Wall St., New York. The agency company was formed in conjunction with Deltec S. A., Rio de Janeiro; Wardell, Hatch & Co. Inc., New York; Edwin S. Webster Jr., Kurt Orban and Henry H. Patton, New York, under a contractural relationship with the mining company in Rio.

The company will engage in the promotion and selling of Itabira iron ore, mined by Companhia Vale do Rio Doce in its Minas Gerais properties, Brazil. The company in New York also will render technical advisory service for the American steel industry regarding the characteristics and results obtained by the use of this ore.



HIGHWAY HITS ROAD: One of five 121-foot girders for the Pennsylvania Turnpike western extension is trucked to the site from the Verona, Pa., plant of the Ingalls Iron Works Co.

Zip Grip Leases Space

About 2000 square feet of space at 1200 Niagara St., Buffalo, was leased by the Zip Grip Co., Toronto, for metal fabrication.

Rust-Oleum Builds Addition

Rust-Oleum Corp., Evanston, Ill., maker of rust preventatives, is building an addition which will double capacity. The project will be completed by the end of July.

Jayson-Bailey May Expand

Jayson-Bailey Co., Binghamton, N. Y., a metalworking plant, has received $150,000 in government orders and expects to add about 35 per cent to its floor space.

Bendix Buys Two Plants

An agreement to purchase South Montrose Mfg. Co.'s plant in South Montrose, Pa., has been completed by Bendix Aviation Corp., Detroit. Bendix will use the plant's 100,000 square feet of floor space for production of defense equipment. Bendix also purchased the Utica, N. Y., plant of Continental Can Co.

Harris Machine Co. Expands

Harris Machine Co., Los Angeles, is constructing a building at 600 W. Whittier Blvd., Whittier, Calif. Completion is scheduled by July.

Dietrich Bros. Inc. Moves

Dietrich Bros. Inc. moved to 2700 Loch Raven Rd., Baltimore. All operations of the company, structural steel fabrication, reinforcing steel, ornamental fabrication, stock yards and the general office, are consolidated in the new building. The company handles about 20,000 tons of steel annually. The company has branches in Washington and Raleigh, N. C.

Crane Packing Builds Plant

Construction of new general offices and plant facilities of Crane Packing Co., Chicago, is under way on Oakton avenue, Morton Grove, Ill. The company makes industrial packings, mechanical seals, oil seals and precision lapping machines.

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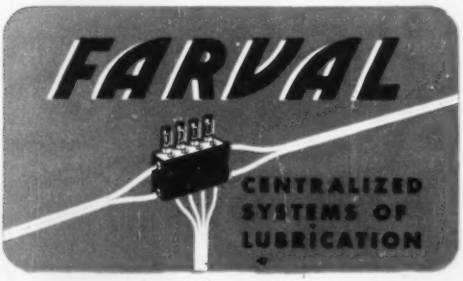

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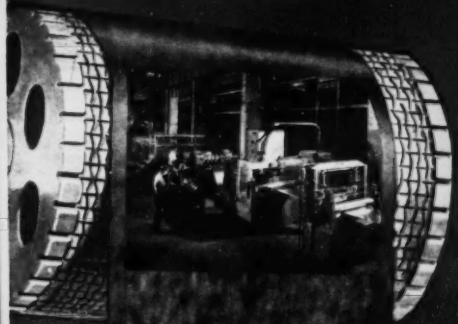

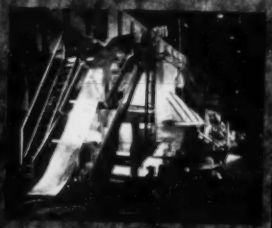

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